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TITLE: A Health Hazard Assessment for Blast Overpressure
Exposures Subtitle - Use of animal test data in the
Development of a human auditory hazard criterion for
impulse noise (Part 2)

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AUDITORY RESEARCH LABORATORY

State University of New York at Plattsburgh Plattsburgh, New York 12901

FINAL REPORT (Part 2)

Use of animal test data in the development of a human auditory hazard criterion for impulse noise

JAYCOR SUBCONTRACT AGREEMENT NO: 950342





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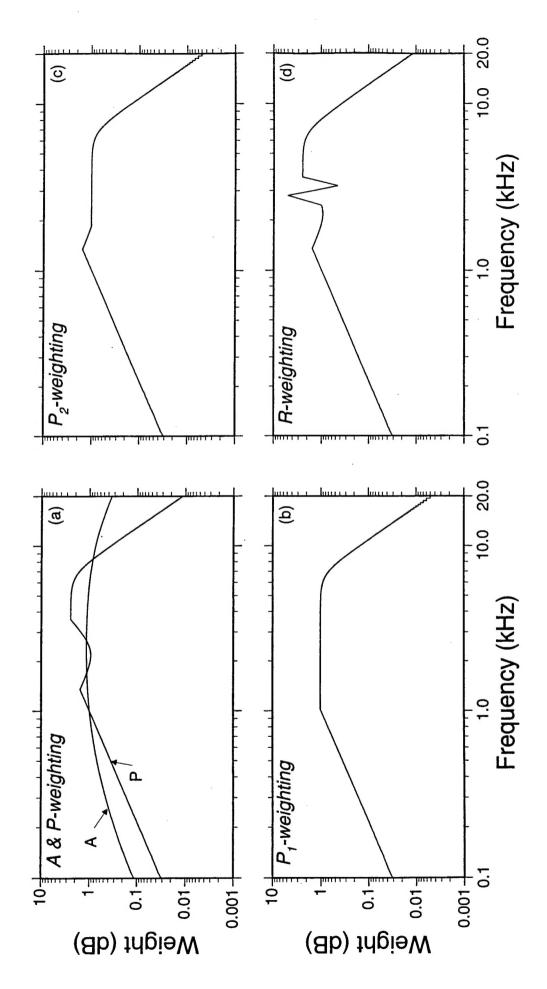
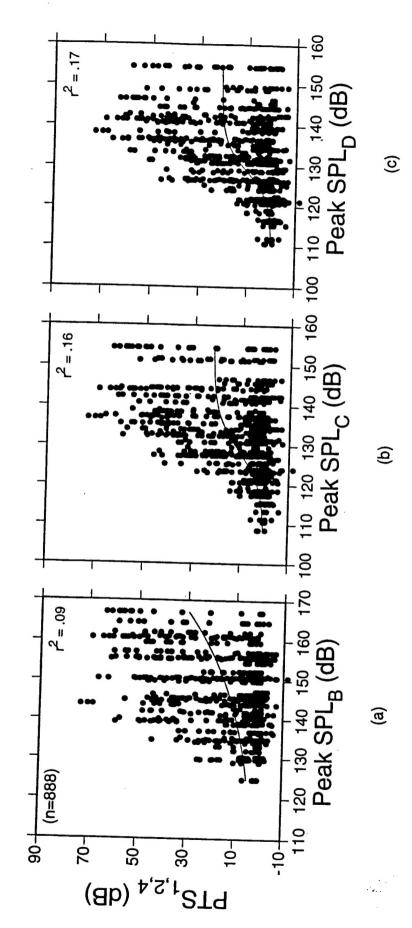
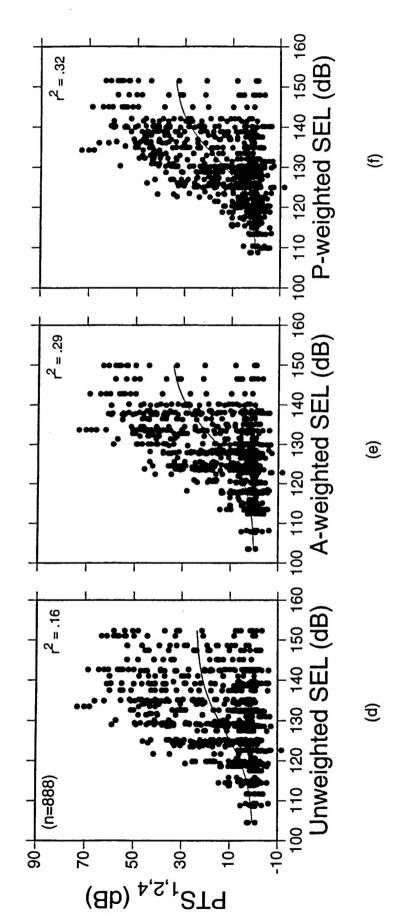


Figure 1. Graphical represention of the weighting functions used to compute some of the hazard indicies [Patterson et al. (1993)].

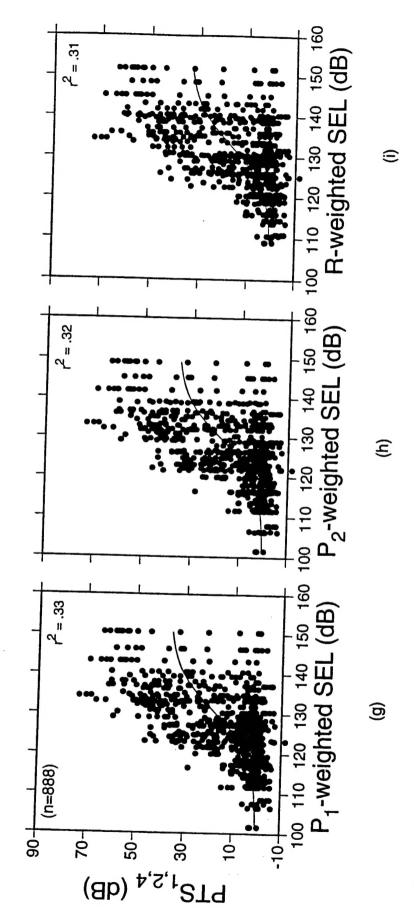


indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=888) exposed to the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 1. (r^2 = coefficient of Figure 2 (a-c)

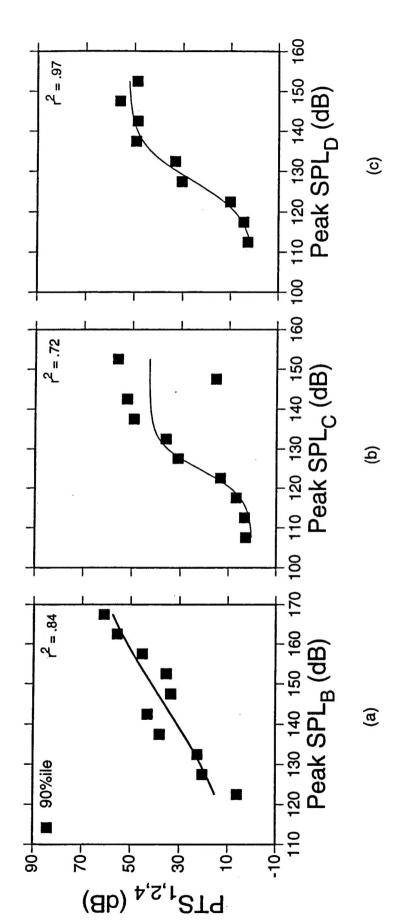
determination)



Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=888) exposed to the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 1. (r^2 = coefficient of determination) Figure 2 (d-f)

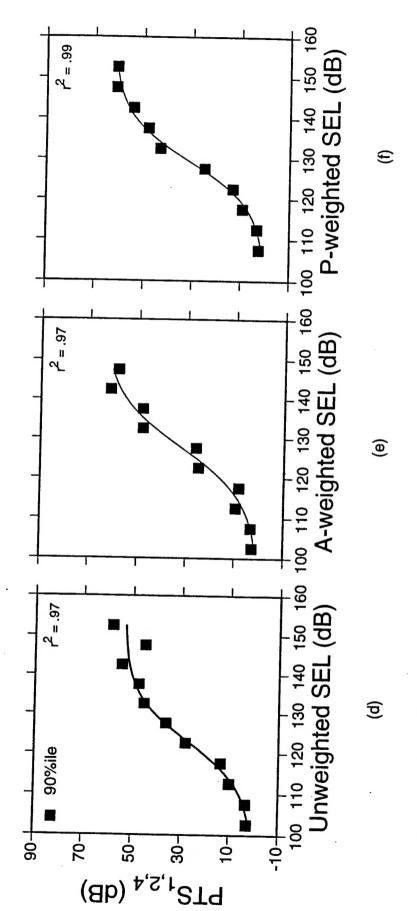


Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=888) exposed to the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 1. (r^2 = coefficient of determination) Figure 2 (g-i)

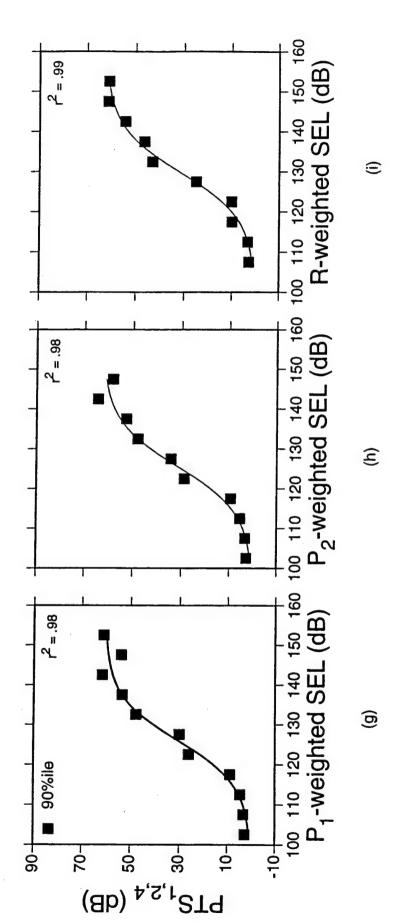


falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Figure 3 (a-c)

1. (r² = coefficient of determination)

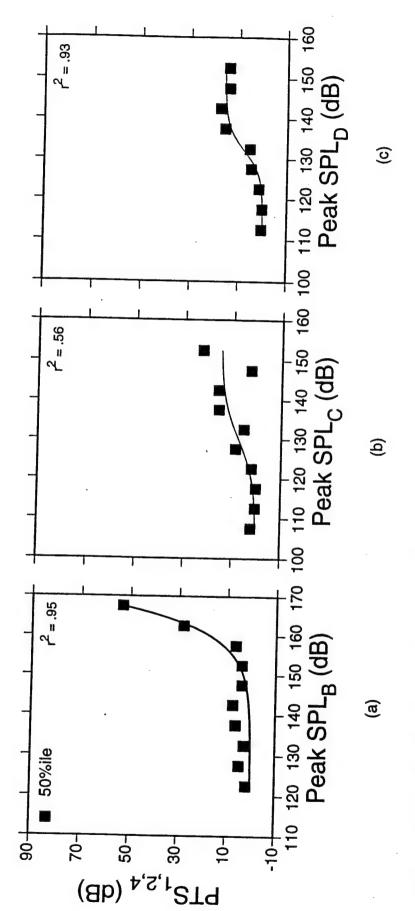


SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Table 1. (r² = coefficient of determination) Figure 3 (d-f)

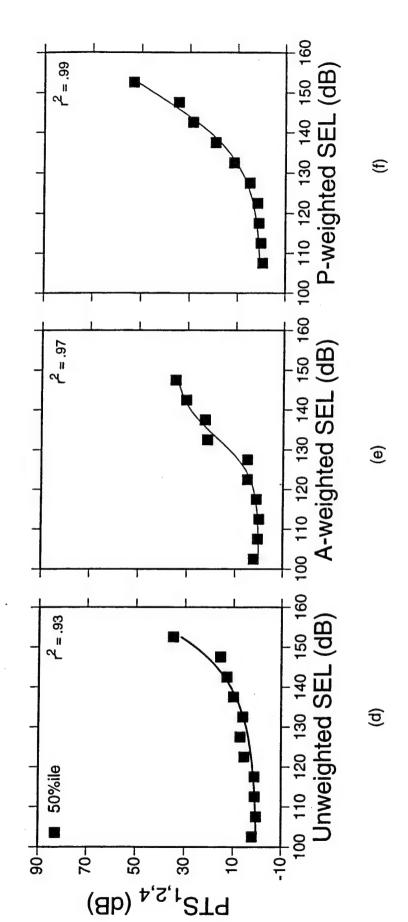


SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Figure 3 (g-i)

Table 1. (r² = coefficient of determination)

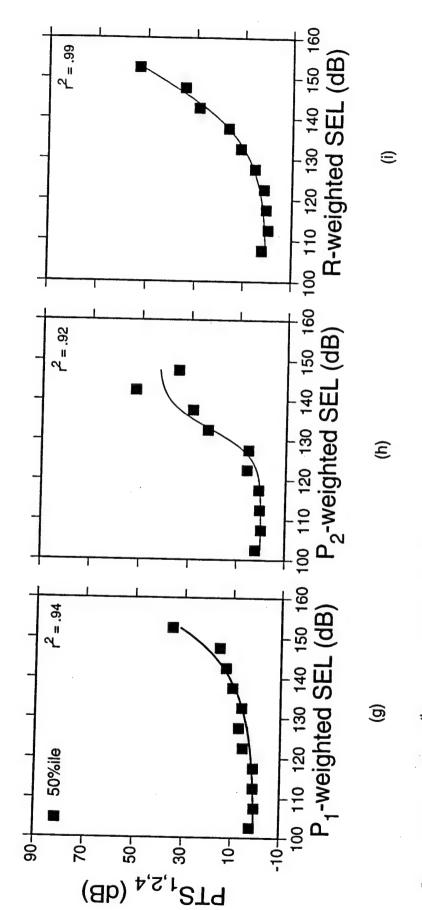


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m C}$, Table 1. (r2 = coefficient of determination) Figure 4 (a-c)



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Table 1. (r^2 = coefficient of determination)



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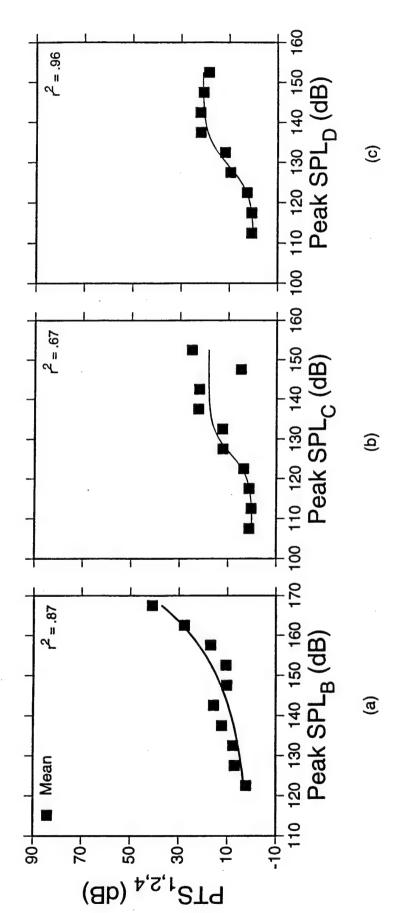
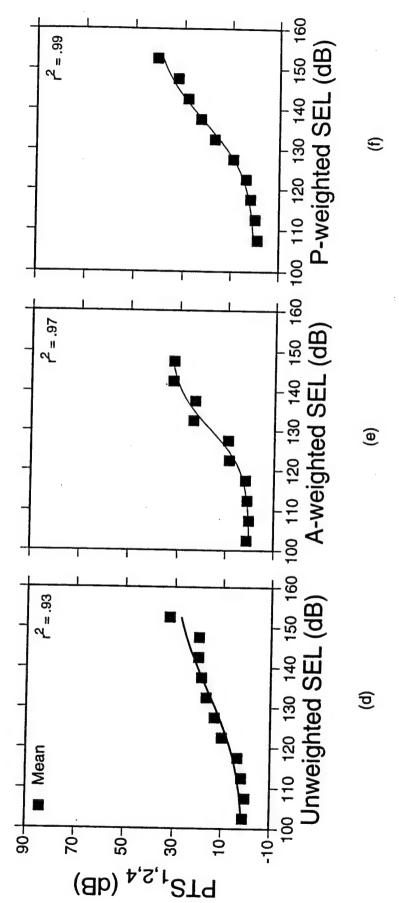
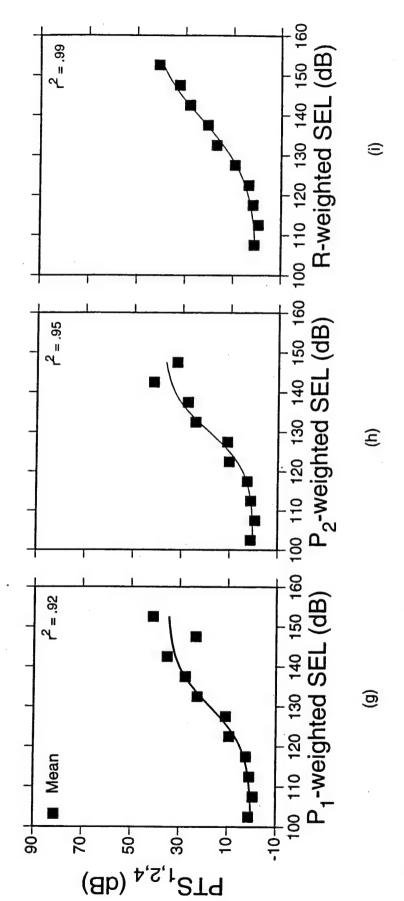


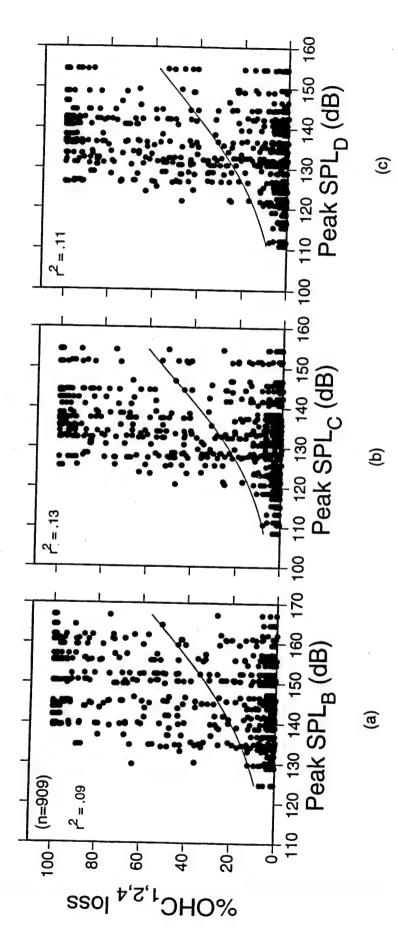
Figure 5 (a-c) The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals falling within 5 The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. and C of Equation (20) corresponding to each regression line are listed in Table 1. (r^2 = coefficient of determination)



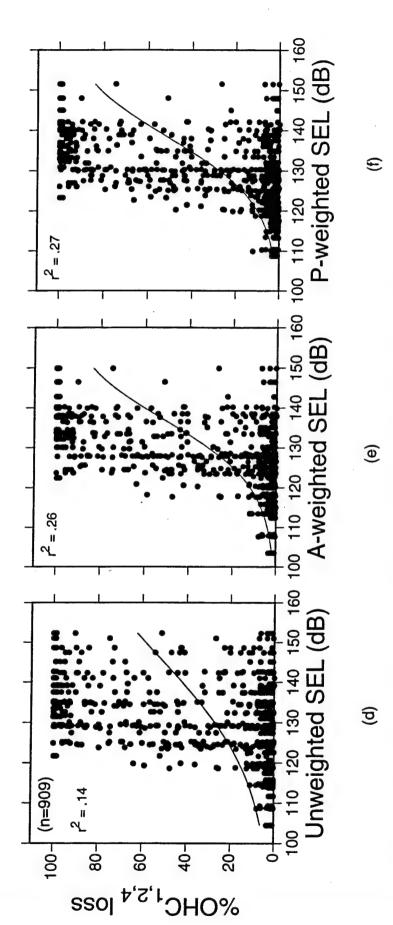
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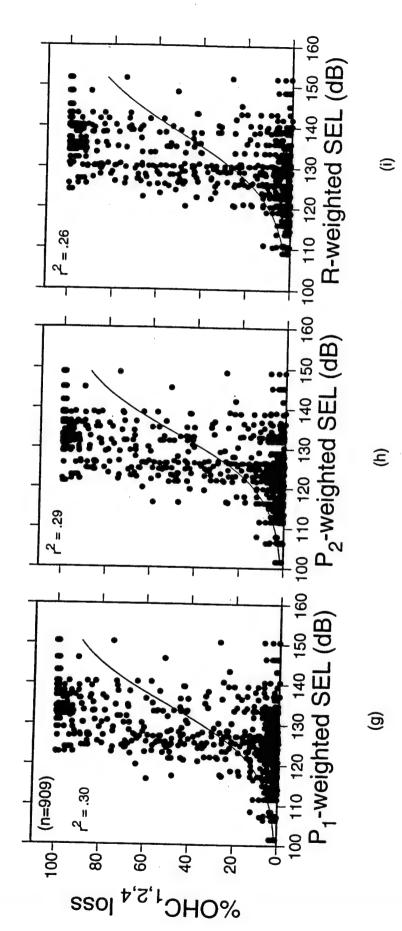
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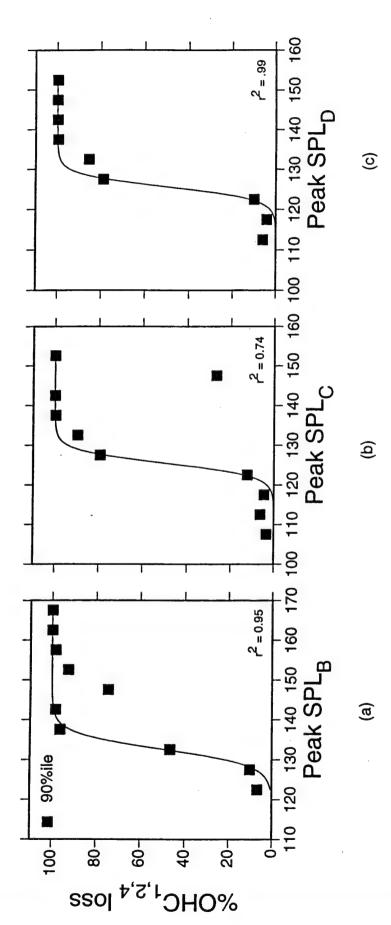
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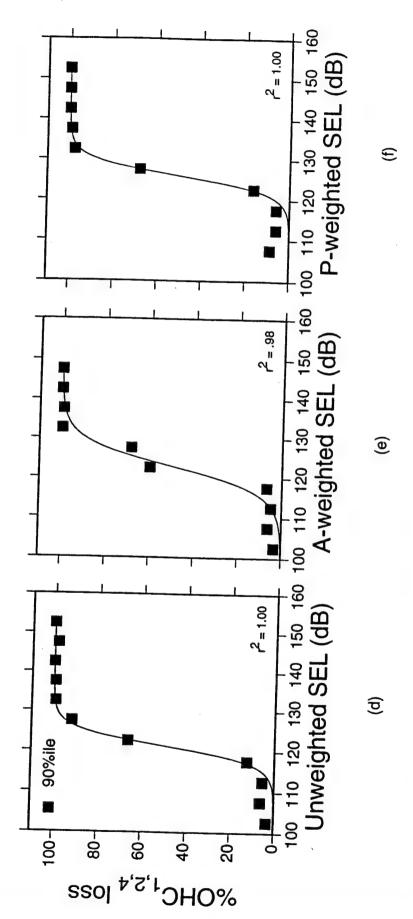
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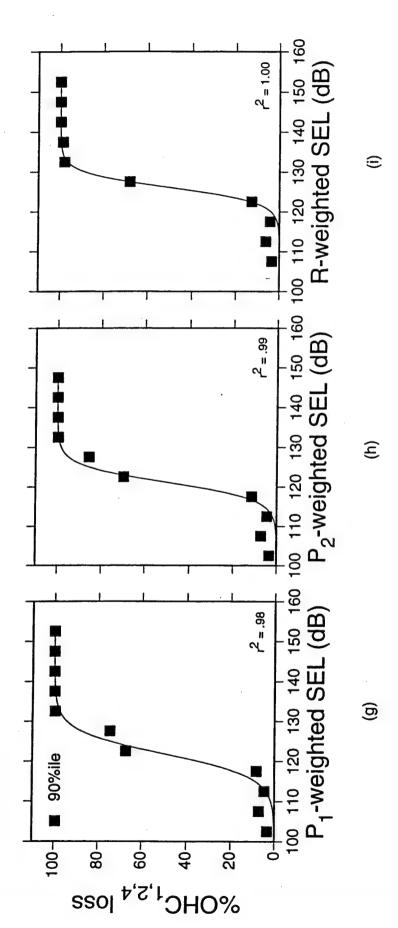
The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane animals (n=909) exposed to the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 2. (r^2 = coefficient of determination) Figure 6 (g-i)



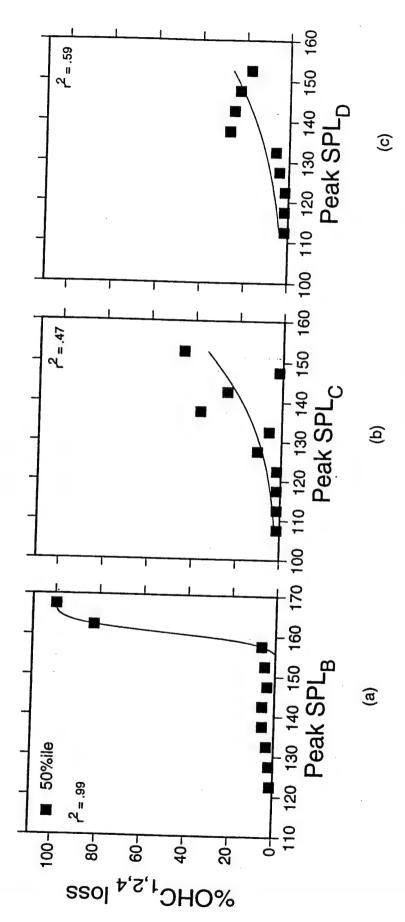
Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{\rm D}$. The solid line is the nonlinear regression fit of frequencies for all animals falling within 5 dB bins of the indicated level of the hazard index (a) membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test each regression line are listed in Table 2. (r^2 = coefficient of determination) Figure 7 (a-c)



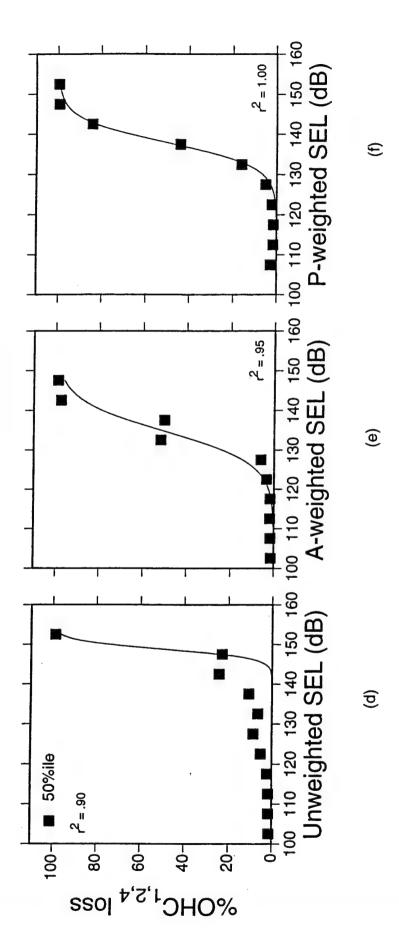
(e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 2. ($r^2 = coefficient$ of determination) Figure 7 (d-f)



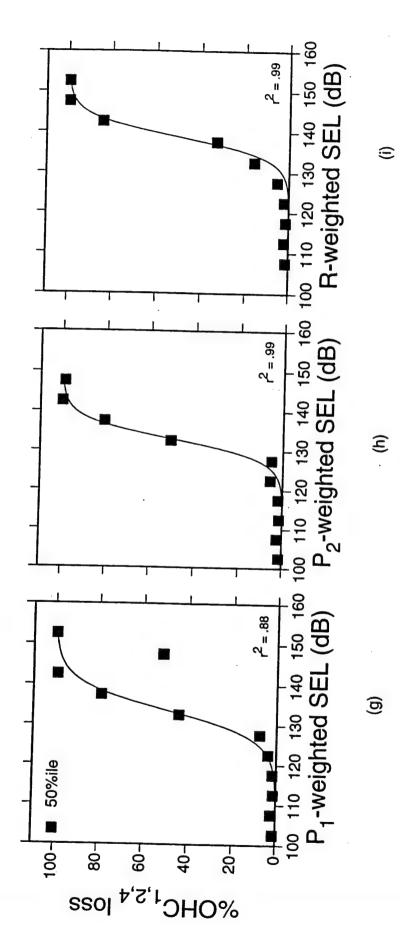
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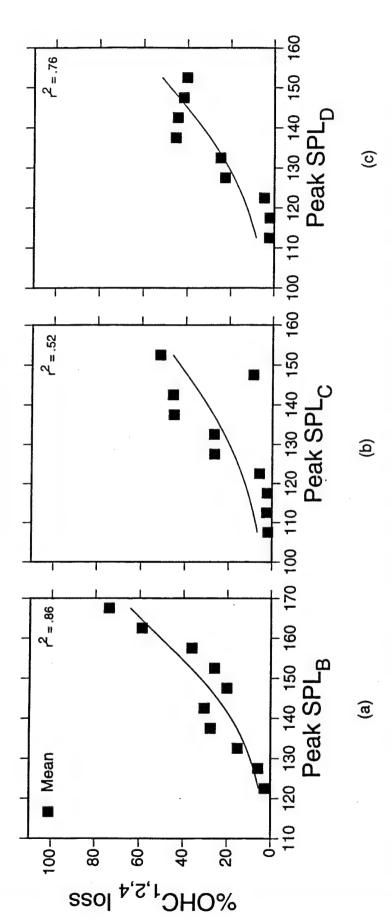
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m D}$. The solid line is the nonlinear regression fit of Equation (20) to the for all animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_R, (b) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar listed in Table 2. (r^2 = coefficient of determination) Figure 8 (a-c)



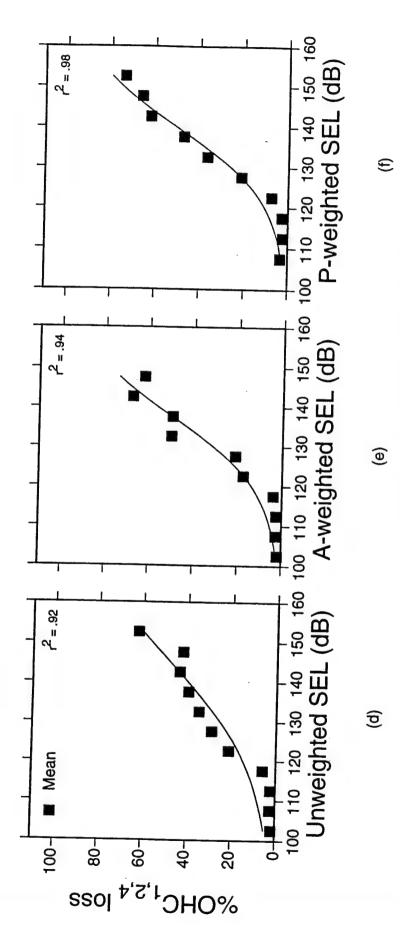
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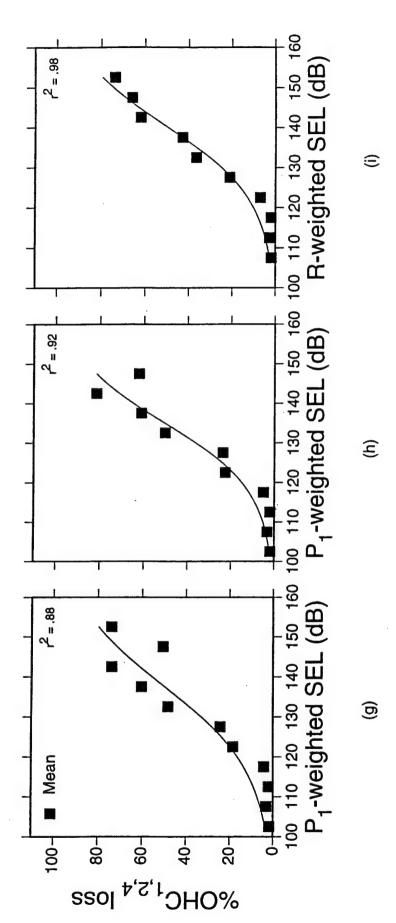


 SPL_C , and (c) Peak SPL_D . The solid line is the nonlinear regression fit of Equation (20) to the data. animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPLB, (b) Peak The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 2. (r^2 = coefficient of determination) Figure 9 (a-c)

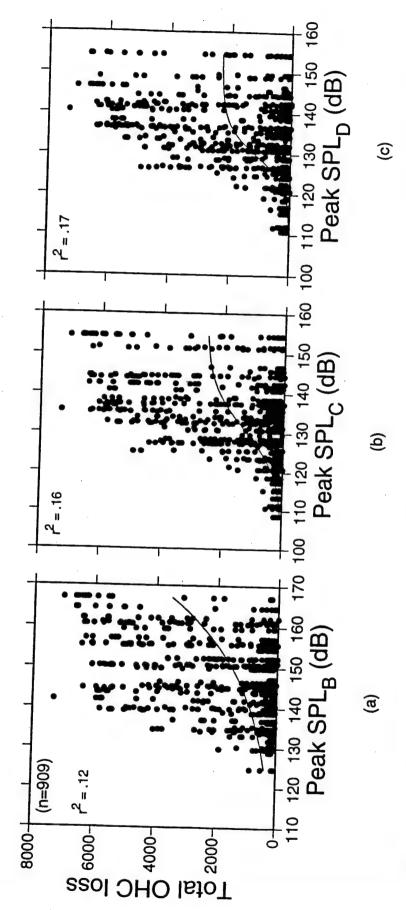


animals falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 2. ($r^2 = \text{coefficient of determination}$) Figure 9 (d-f)

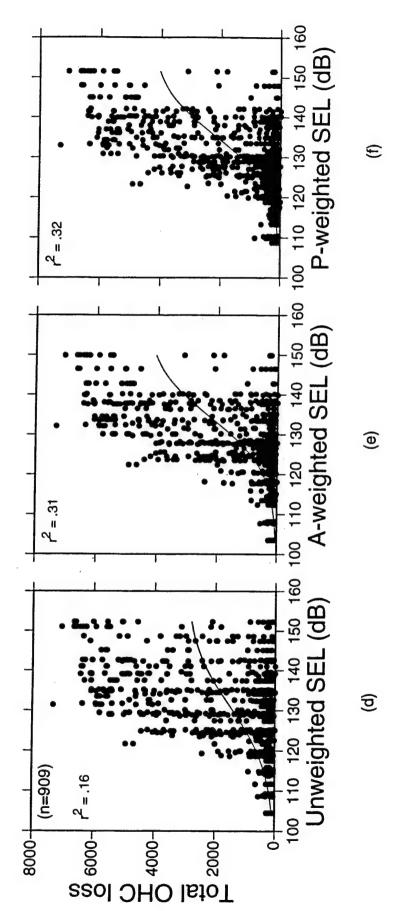
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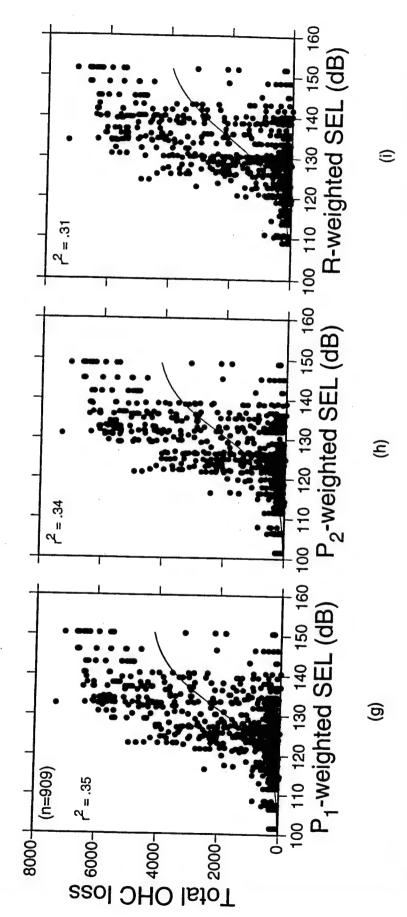
P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation animals falling within 5 dB bins of the indicated level of the hazard index (g) P1-weighted SEL, (h) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 2. (r^2 = coefficient of determination) Figure 9 (g-i)



index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit Figure 10 (a-c) Total OHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination)



index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear Figure 10 (d-f) Total OHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination)



nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Total OHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination) index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the Figure 10 (g-i)

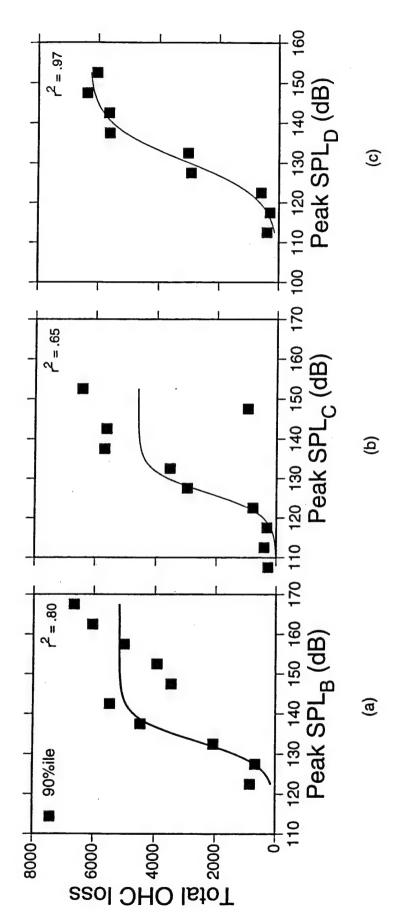
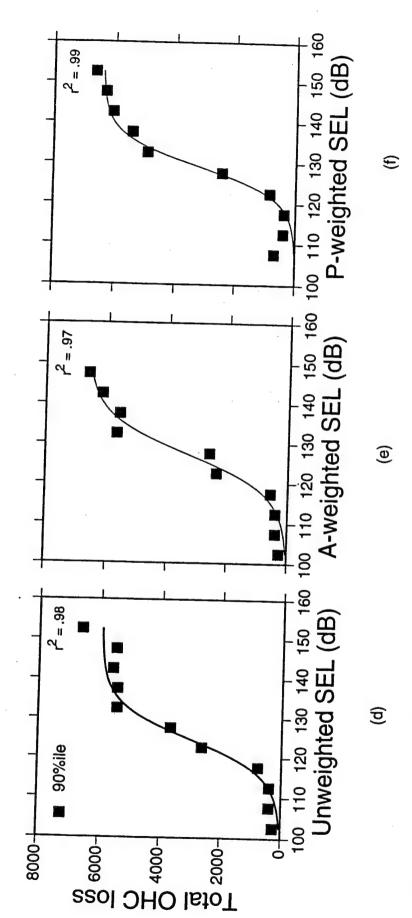
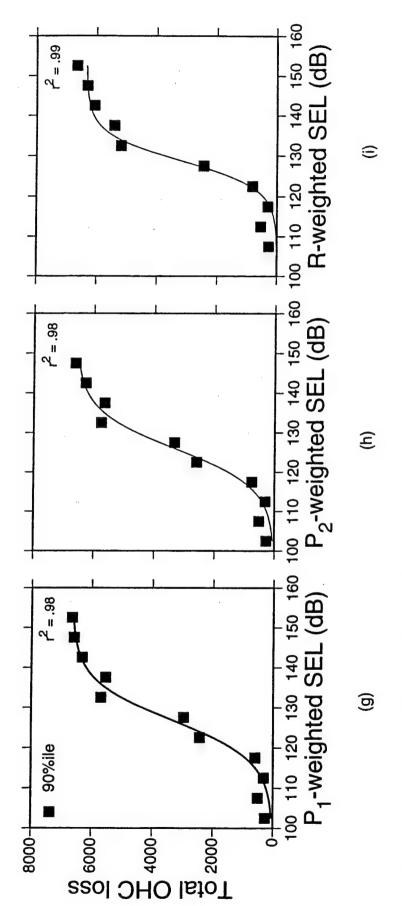


Figure 11 (a-c) The 90th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
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hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the Figure 11 (d-f) The 90th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. ($r^2 =$ coefficient of determination)



hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Figure 11 (g-i) The 90th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination)

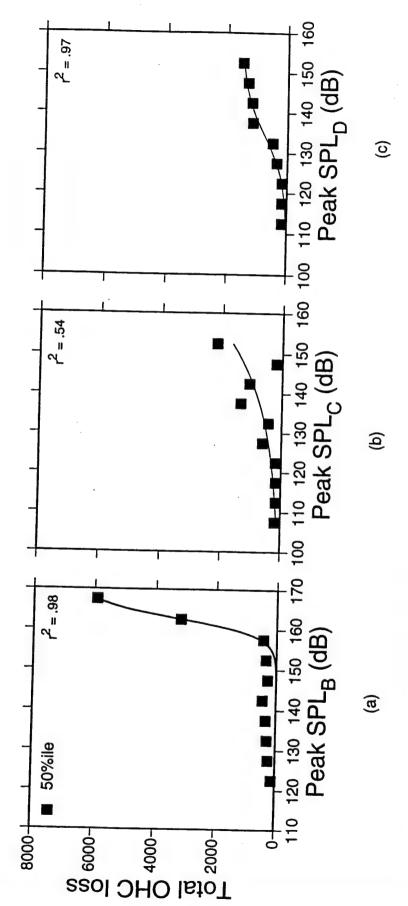
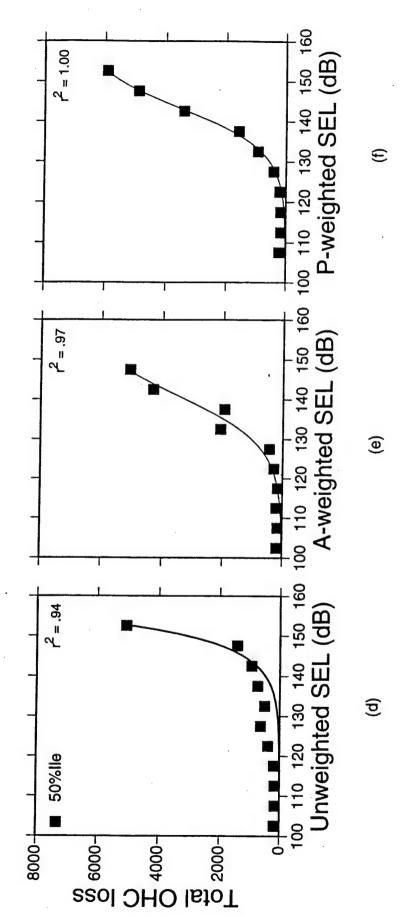
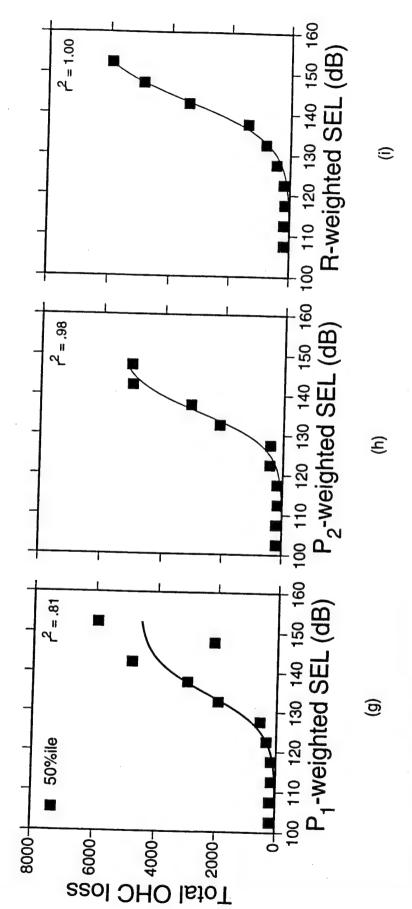


Figure 12 (a-c) The 50th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. ($r^2 =$ coefficient of determination)

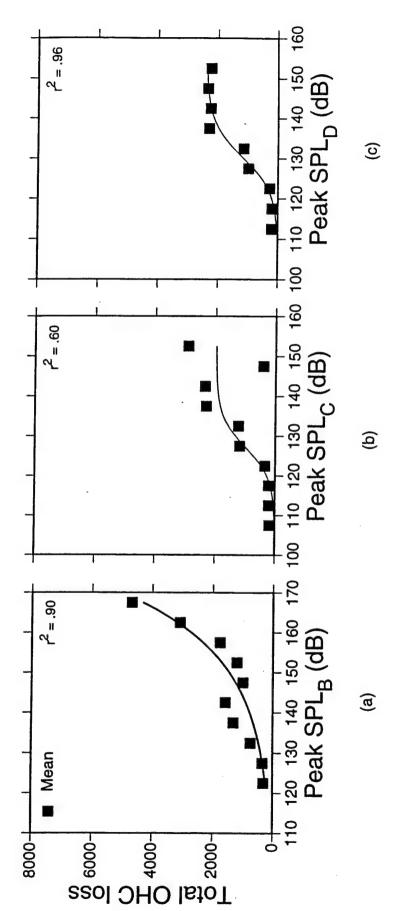


hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the The 50th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination) Figure 12 (d-f)

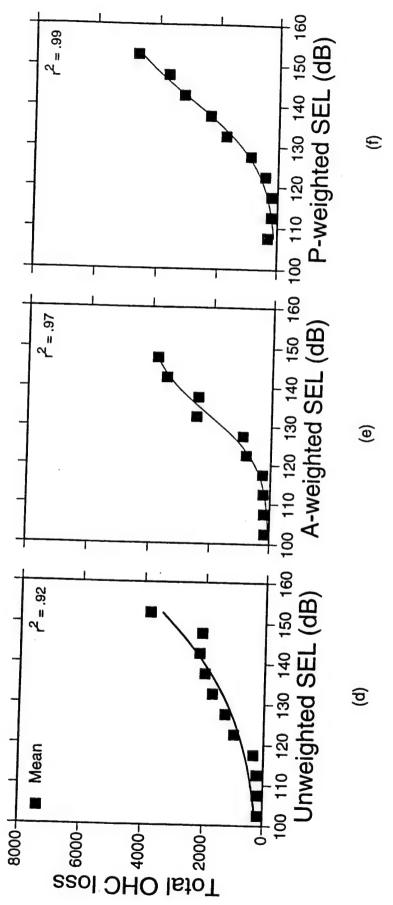


hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the The 50th percentile total OHC loss for all animals falling within 5 dB bins of the indicated level of the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination) Figure 12 (g-i)

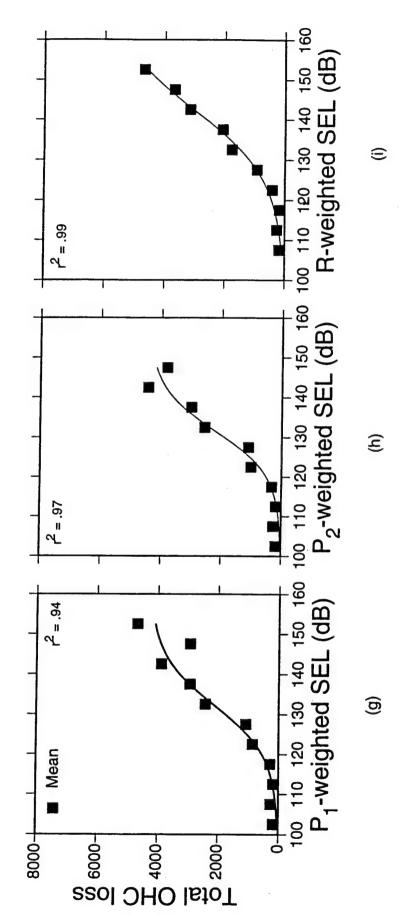
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index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to Figure 13 (a-c) The mean total OHC loss for all animals falling within 5 dB bins of the indicated level of the hazard each regression line are listed in Table 3. (r^2 = coefficient of determination)



index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear The mean total OHC loss for all animals falling within 5 dB bins of the indicated level of the hazard regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 3. ($r^2 =$ coefficient of determination) Figure 13 (d-f)



nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation The mean total OHC loss for all animals falling within 5 dB bins of the indicated level of the hazard (20) corresponding to each regression line are listed in Table 3. (r^2 = coefficient of determination) index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the Figure 13 (g-i)

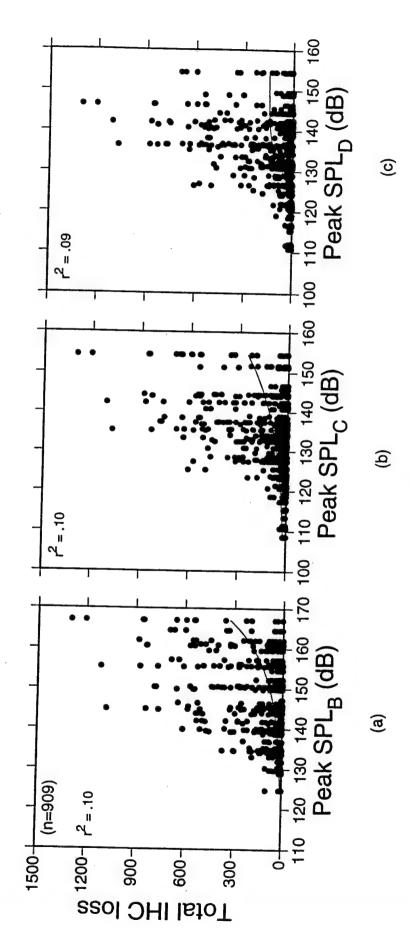


Figure 14 (a-c) Total IHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard index Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of regression line are listed in Table 4. ($r^2 = \text{coefficient of determination}$)

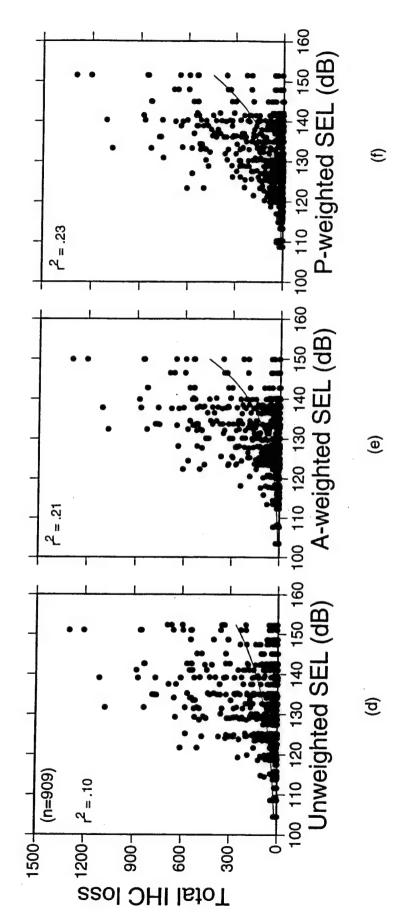
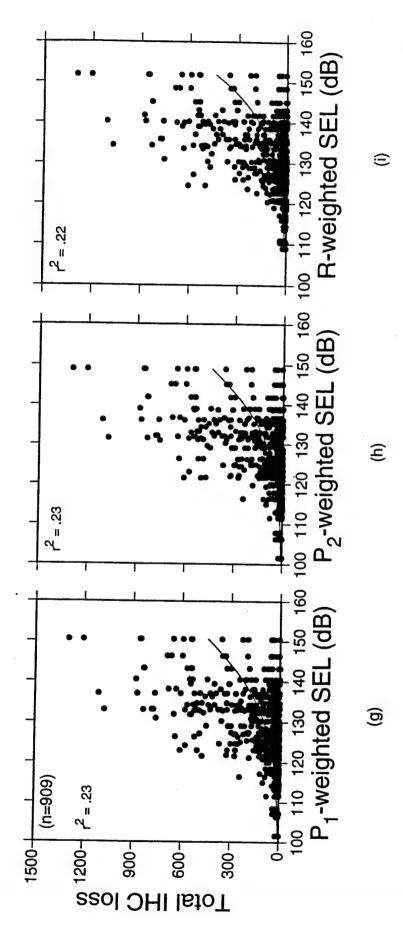


Figure 14 (d-f) Total IHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)



Total IHC loss in the cochlea of each animal (n=909) exposed to the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. ($r^2 =$ coefficient of determination) Figure 14 (g-i)

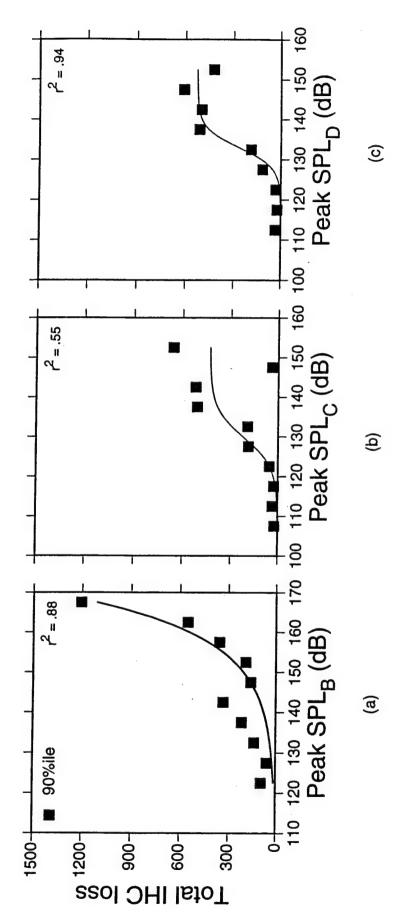
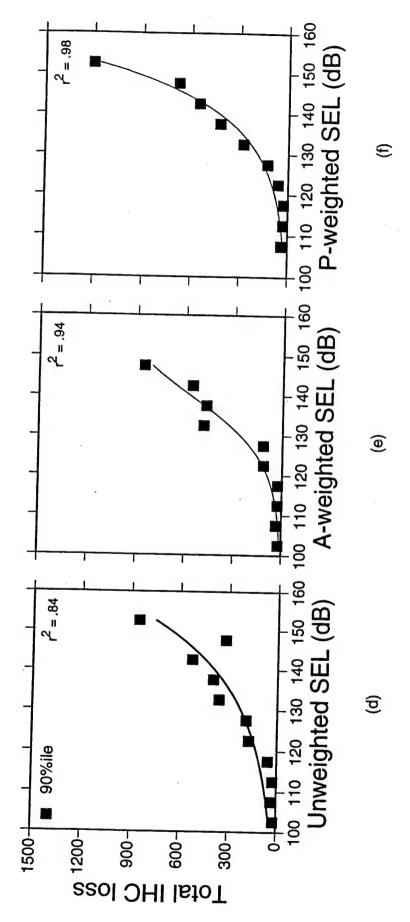
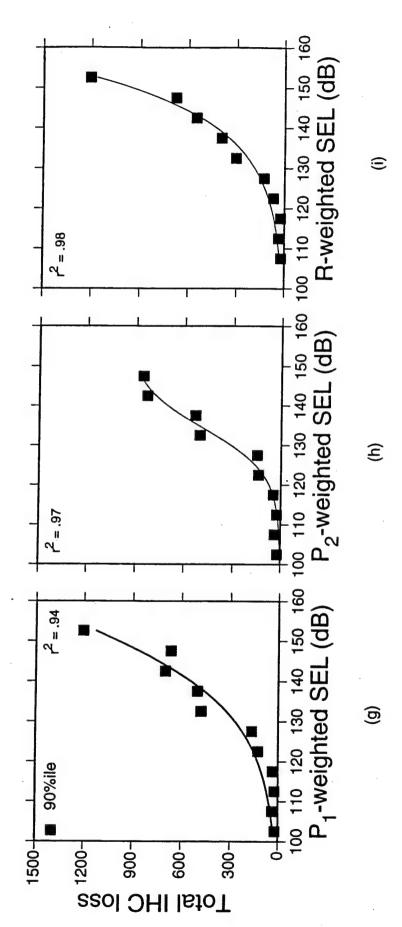


Figure 15 (a-c) The 90th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)



hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation The 90th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination) Figure 15 (d-f)



hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Figure 15 (g-i) The 90th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)

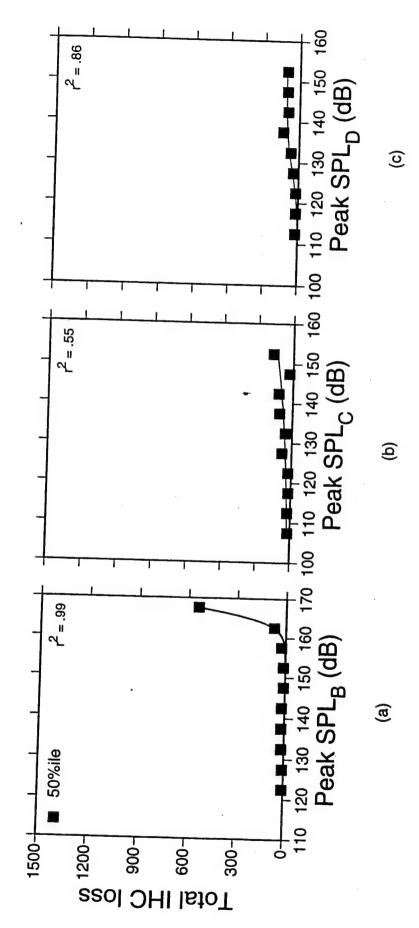
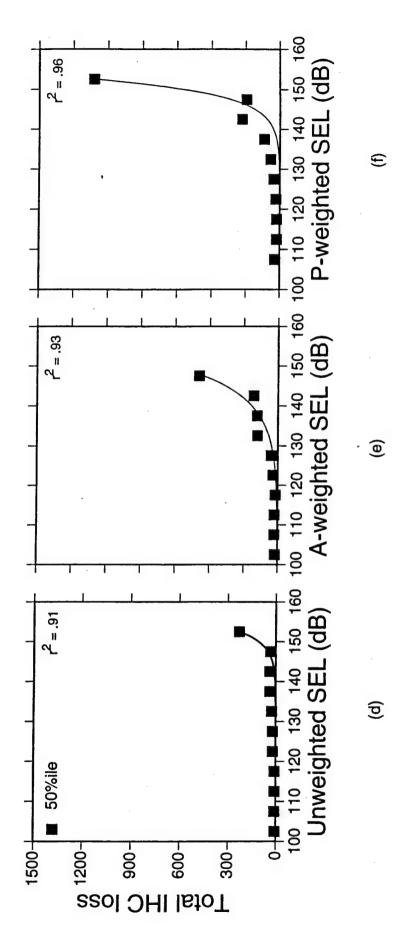
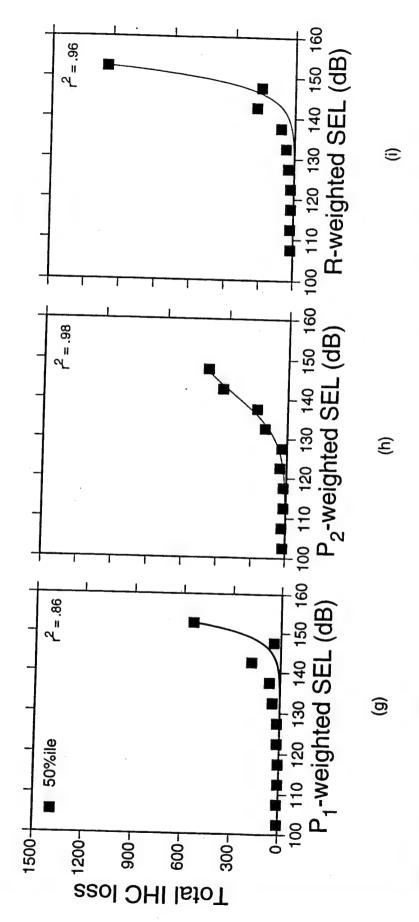


Figure 16 (a-c) The 50th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. ($r^2 =$ coefficient of determination)



hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Figure 16 (d-f) The 50th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)



hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Figure 16 (g-i) The 50th percentile total IHC loss for all animals falling within 5 dB bins of the indicated level of the (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)

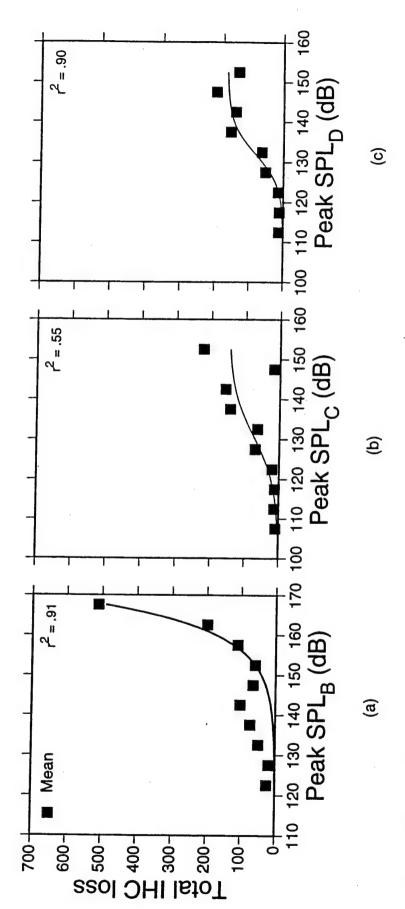
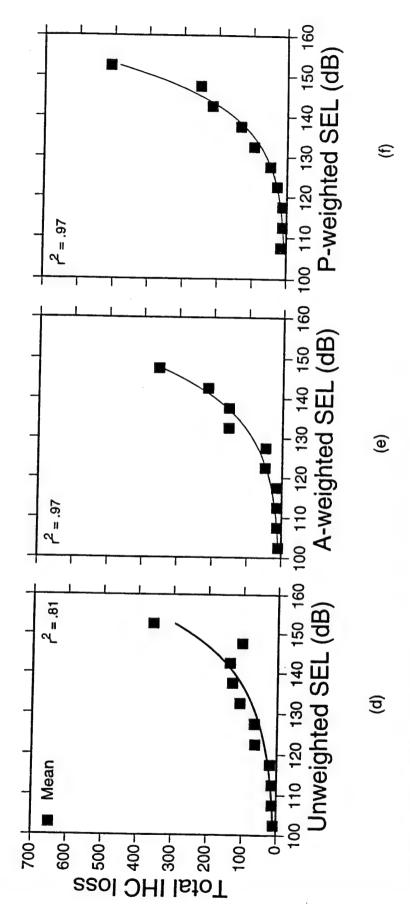


Figure 17 (a-c) The mean total IHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of regression line are listed in Table 4. (r^2 = coefficient of determination)



The mean total IHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. ($r^2 = \text{coefficient of determination}$) Figure 17 (d-f)

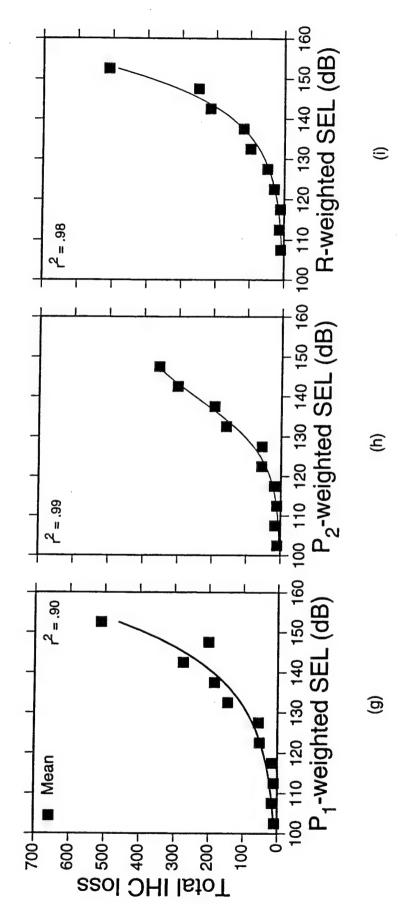


Figure 17 (g-i) The mean total IHC loss for all animals falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 4. (r^2 = coefficient of determination)

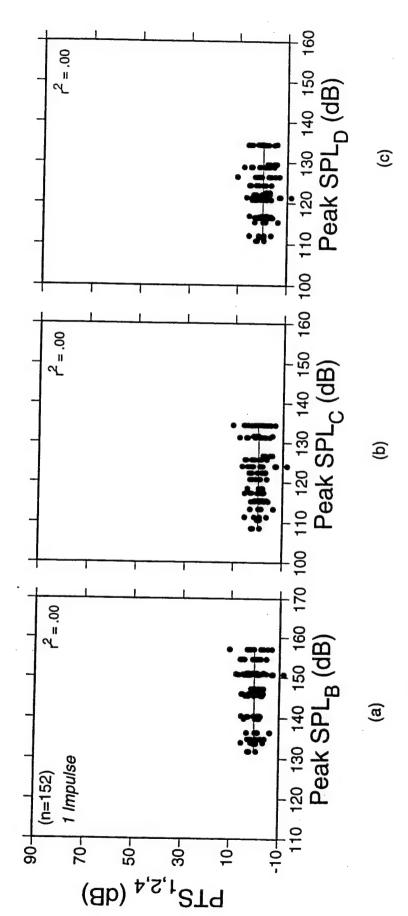


Figure 18 (a-c) Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=152) exposed to parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table a single impulse at the indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the data. The three

5. (r² = coefficient of determination)

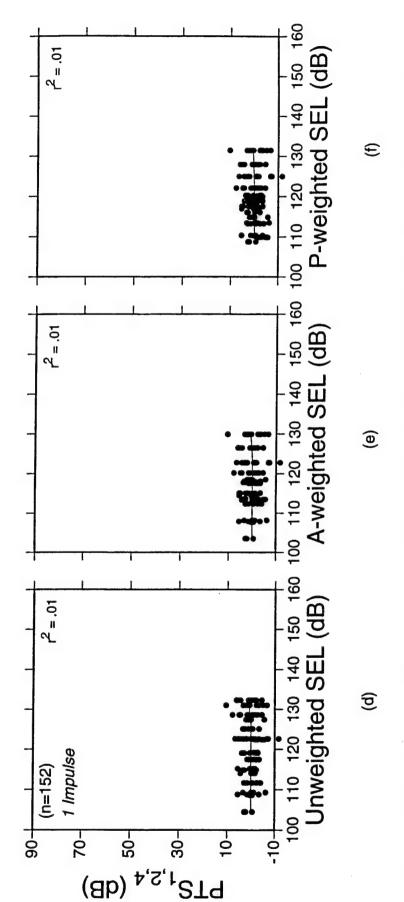
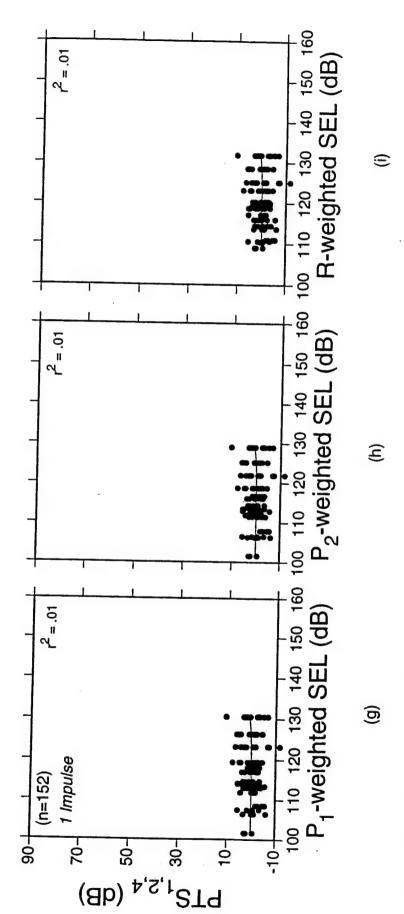


Figure 18 (d-f) Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=152) exposed to SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line a single impulse at the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted are listed in Table 5. (r^2 = coefficient of determination)



Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal (n=152) exposed to SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line a single impulse at the indicated level of the hazard index (g) P $_1$ -weighted SEL, (h) P $_2$ -weighted are listed in Table 1. (r^2 = coefficient of determination) Figure 18 (g-i)

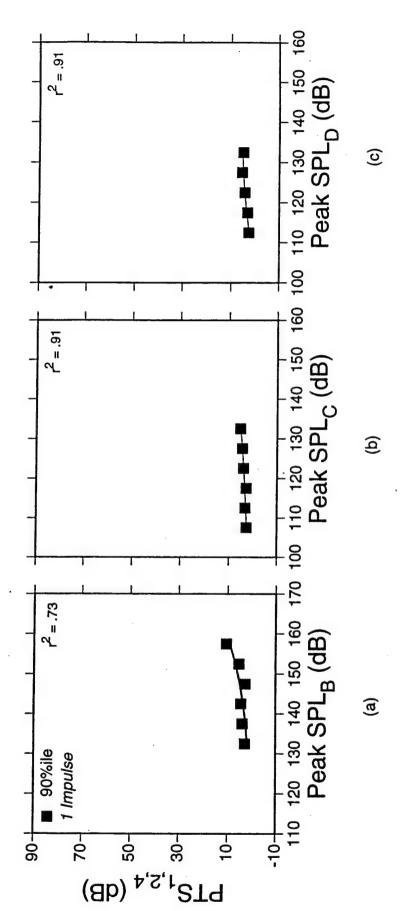


Figure 19 (a-c) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of each regression line are listed in Table 5. (r^2 = coefficient of determination)

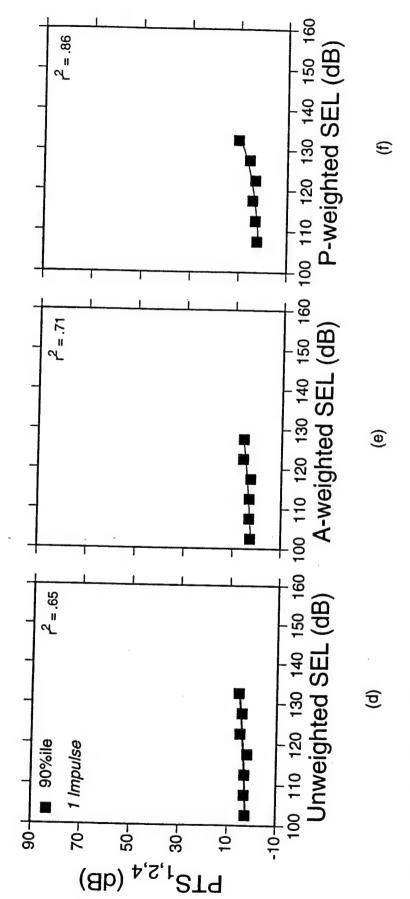
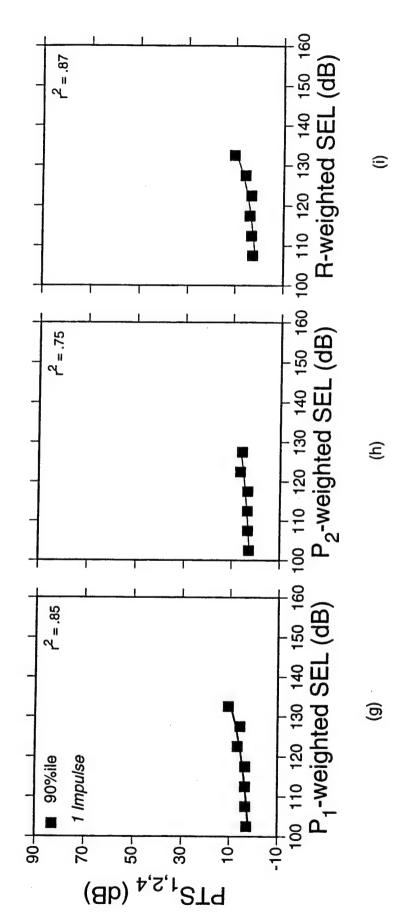


Figure 19 (d-f) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear corresponding to each regression line are listed in Table 5. ($r^2 = \text{coefficient of determination}$)



weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) P₁-Figure 19 (g-i) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals each regression line are listed in Table 5. (r^2 = coefficient of determination)

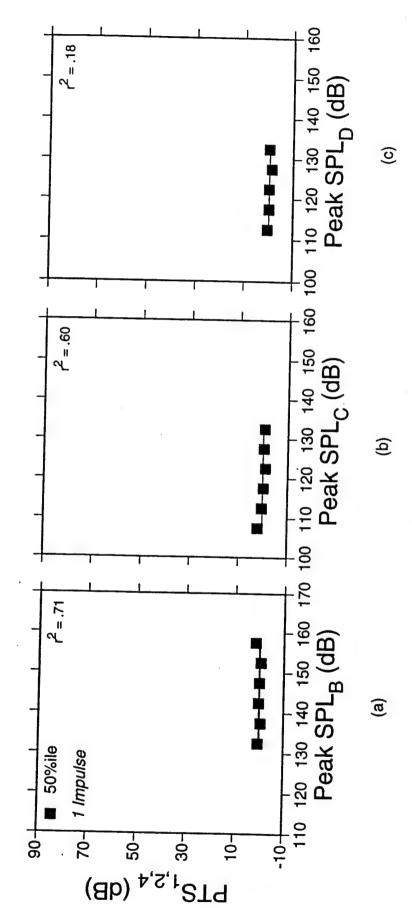


Figure 20 (a-c) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of each regression line are listed in Table 5. ($r^2 = \text{coefficient of determination}$)

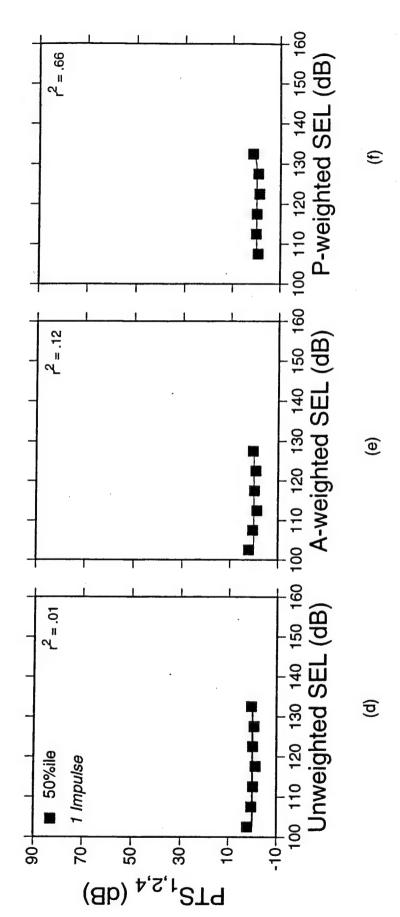
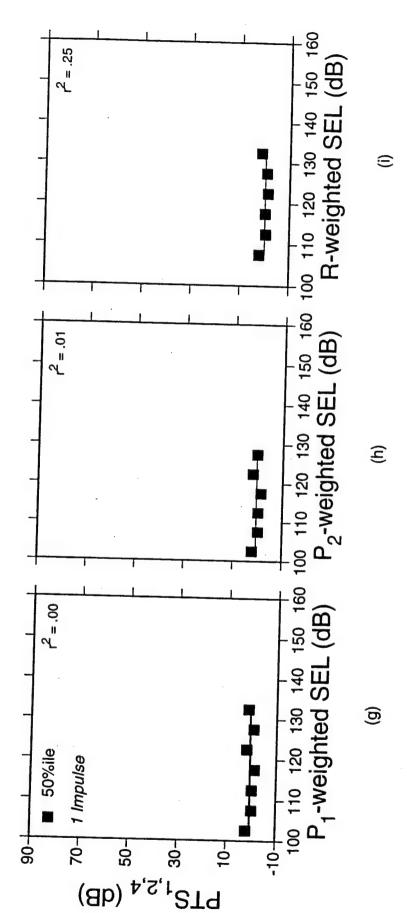


Figure 20 (d-f) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear corresponding to each regression line are listed in Table 5. (r^2 = coefficient of determination)



weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) $\,P_1^{\,-}$ The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals each regression line are listed in Table 5. (r^2 = coefficient of determination) Figure 20 (g-i)

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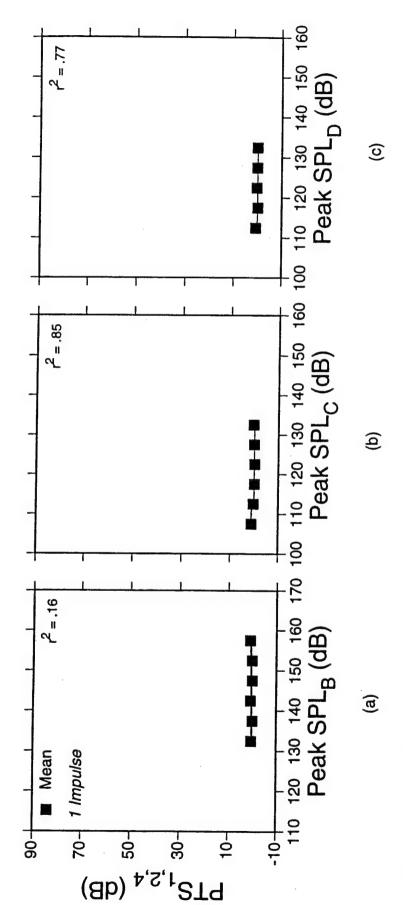
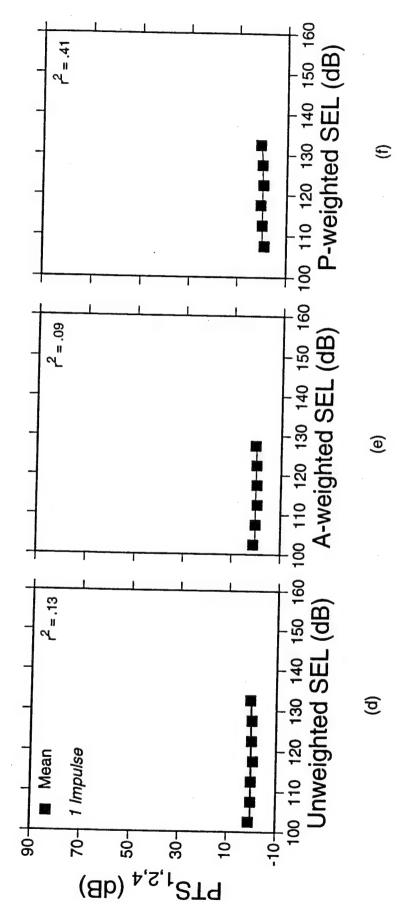
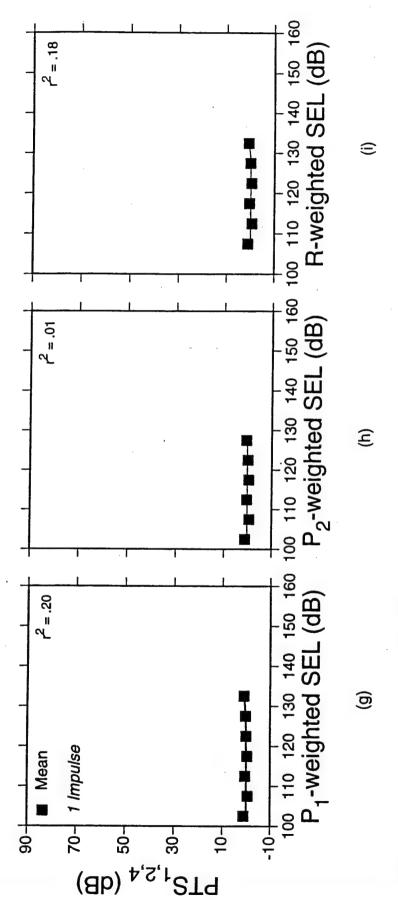


Figure 21 (a-c) The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to a data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) listed in Table 5. (r2 = coefficient of determination)

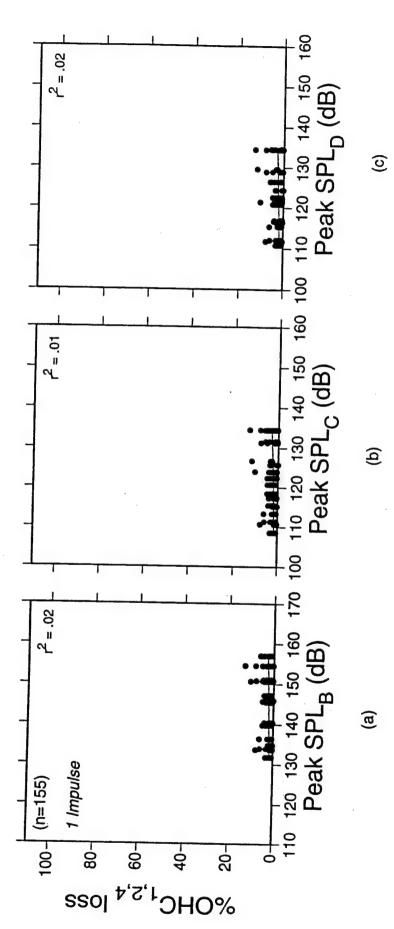


to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 5. (r^2 = coefficient of determination) Figure 21 (d-f)

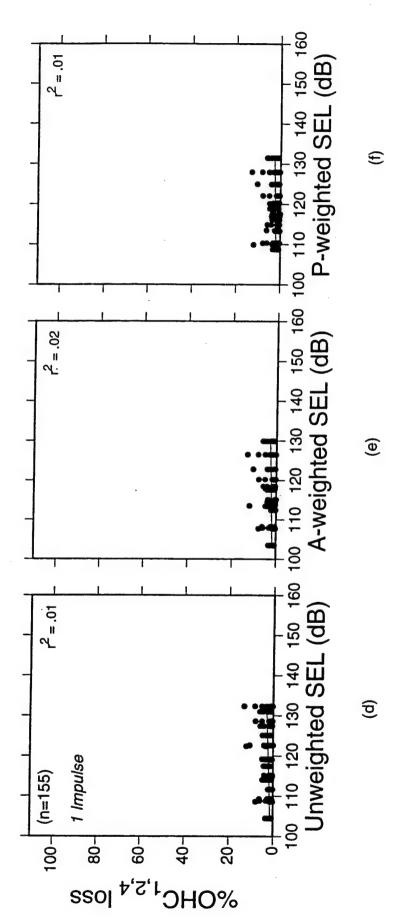
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to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 5. (r^2 = coefficient of determination) Figure 21 (g-i)



SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation Figure 22 (a-c) The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane animals exposed to a single impulse (n=155) at the indicated level of the hazard index (a) Peak centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table6. ($r^2 = coefficient$ of determination)



animals exposed to a single impulse (n=155) at the indicated level of the hazard index (d) Unweighted Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all regression line are listed in Table 6. (r^2 = coefficient of determination) Figure 22 (d-f)

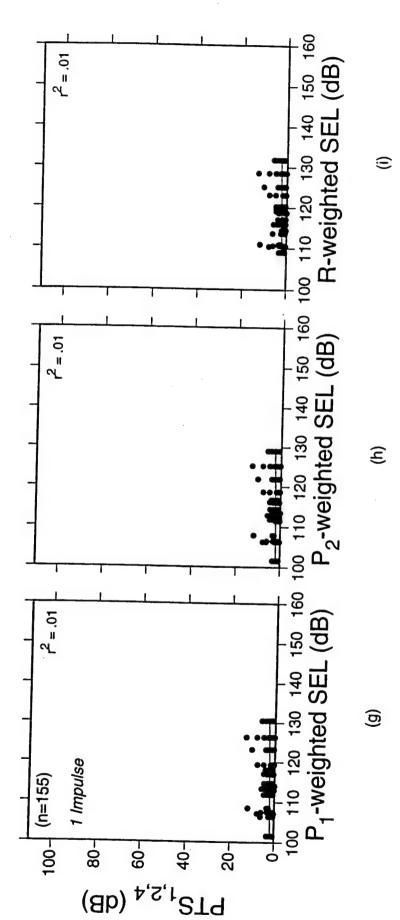
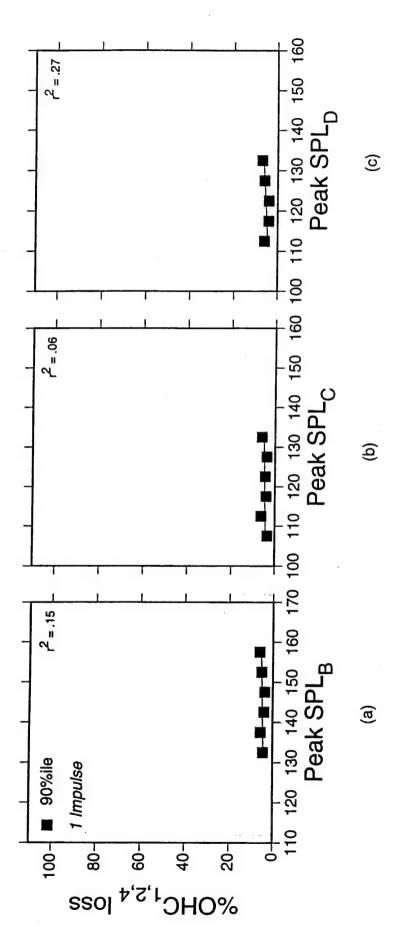
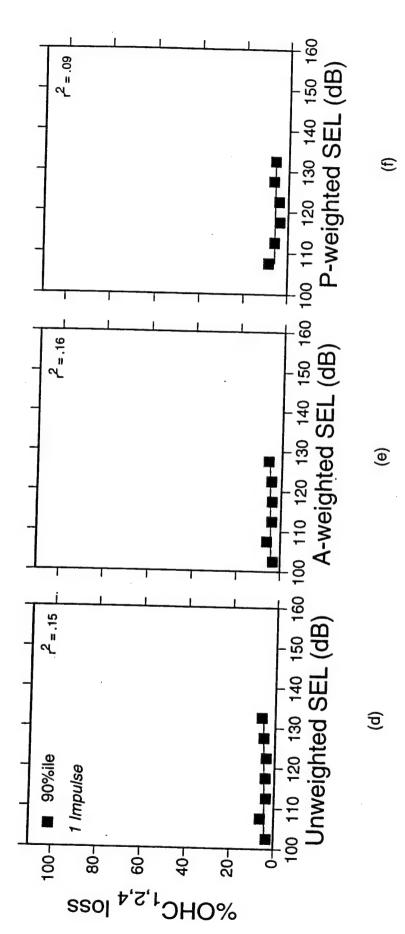


Figure 22 (g-i) The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) animals exposed to a single impulse (n=155) at the indicated level of the hazard index (g) $m P_1$ corresponding to each regression line are listed in Table 6. (r^2 = coefficient of determination) weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear

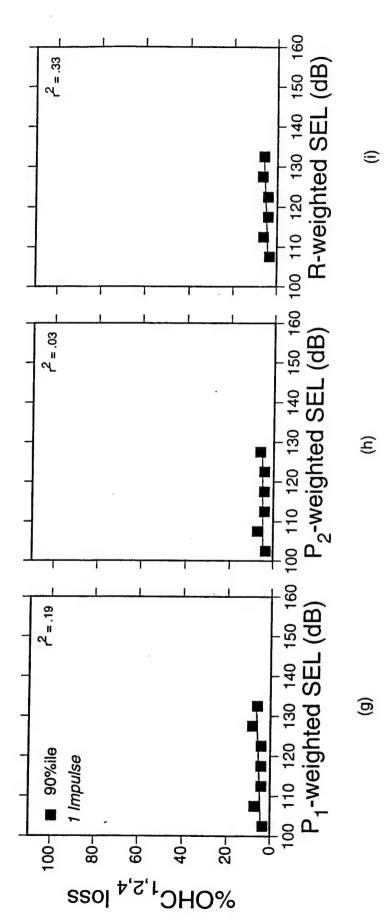


index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to Figure 23 (a-c) The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar each regression line are listed in Table 6. (r^2 = coefficient of determination)

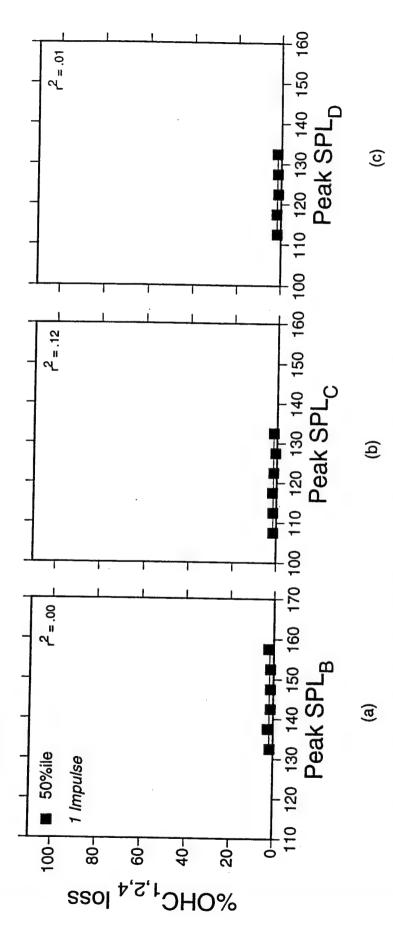


membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r^2 = coefficient of determination) Figure 23 (d-f)

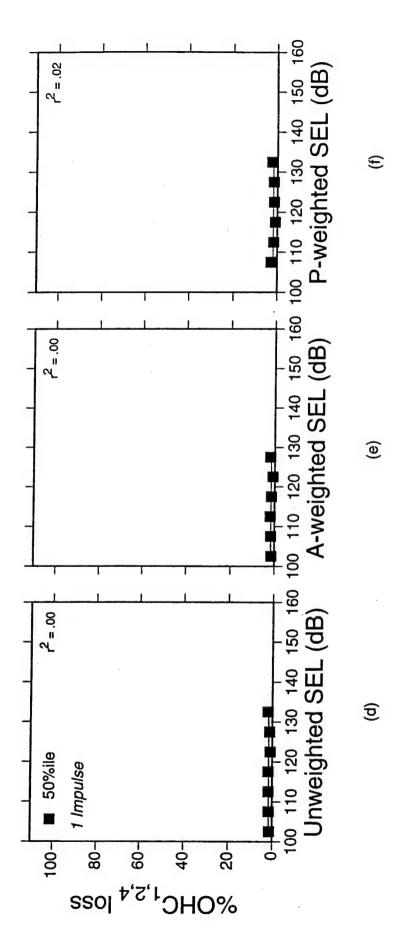
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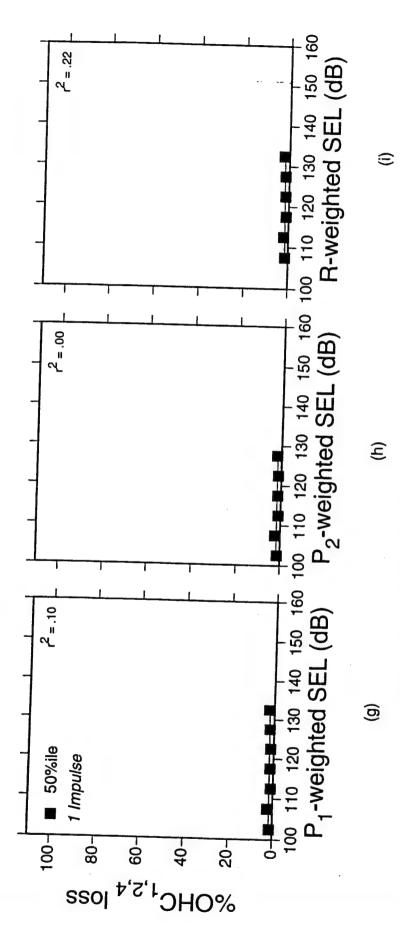
all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r^2 = coefficient of determination) Figure 23 (g-i)



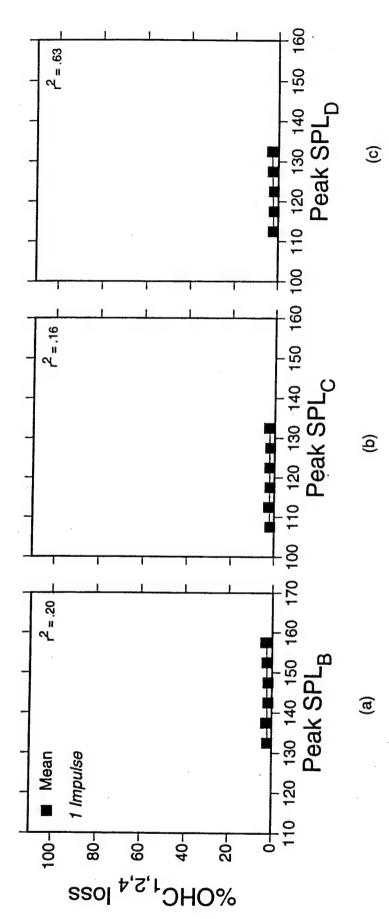
index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to Figure 24 (a-c) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar each regression line are listed in Table 6. (r^2 = coefficient of determination)



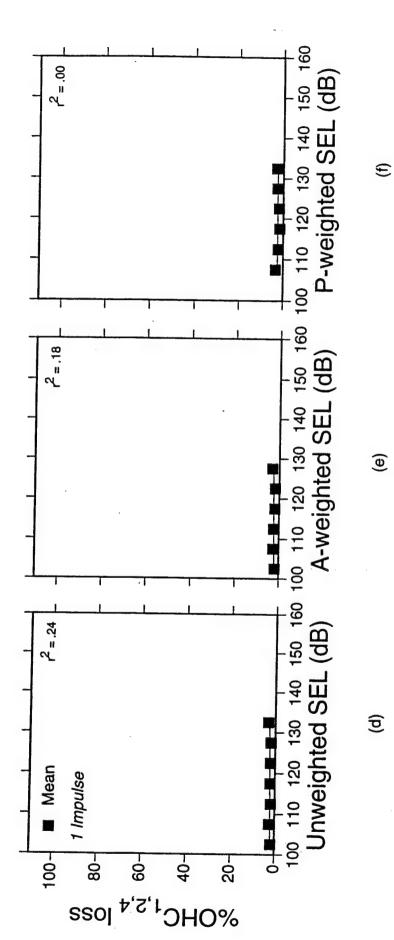
all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r^2 = coefficient of determination) Figure 24 (d-f)



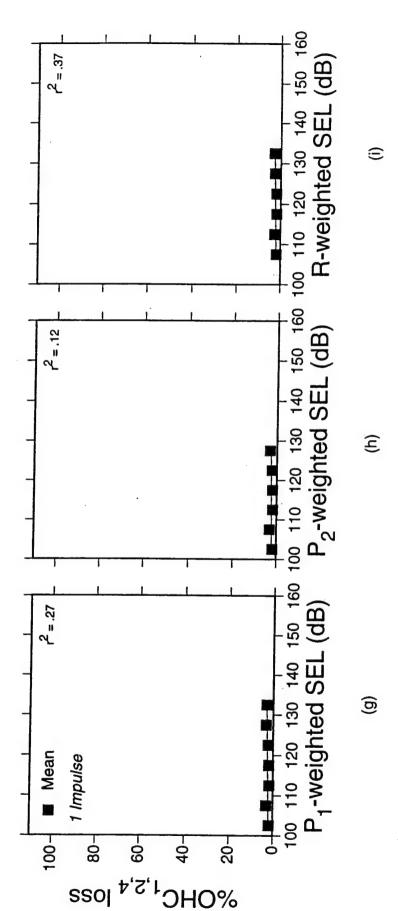
membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r^2 = coefficient of determination) Figure 24 (g-i)



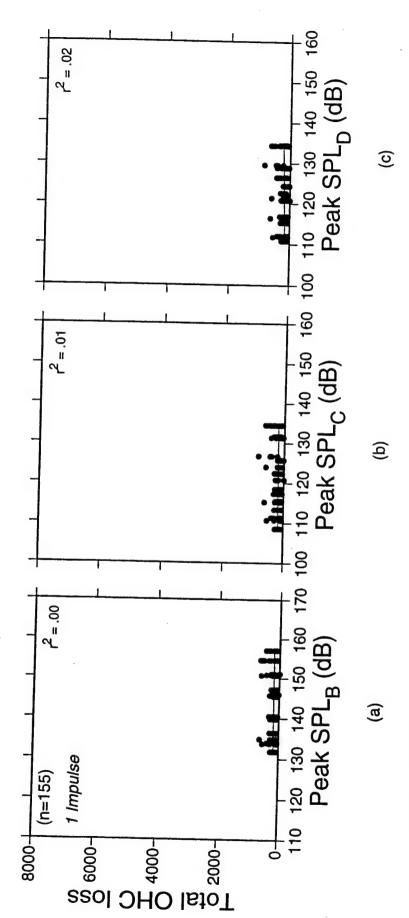
Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Figure 25 (a-c) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all regression line are listed in Table 6. (r^2 = coefficient of determination)



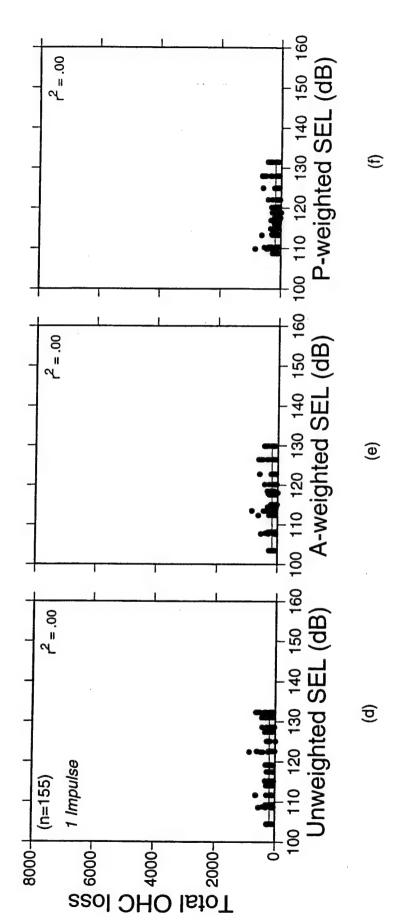
at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r2 = coefficient of determination) Figure 25 (d-f)



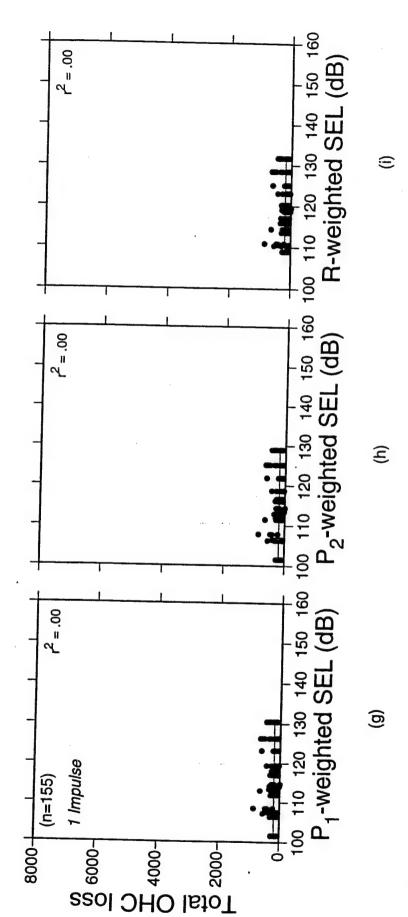
P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) P1-weighted SEL, (h) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 6. (r2 = coefficient of determination) Figure 25 (g-i)



nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation Figure 26 (a-c) Total OHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of determination)



level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Figure 26 (d-f) Total OHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated Equation (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of determination)



solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C Figure 26 (g-i) Total OHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 = \text{coefficient of}$ determination)

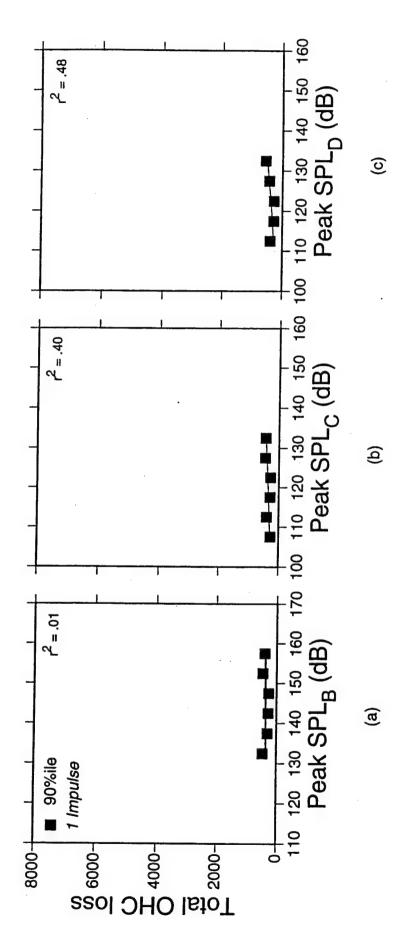
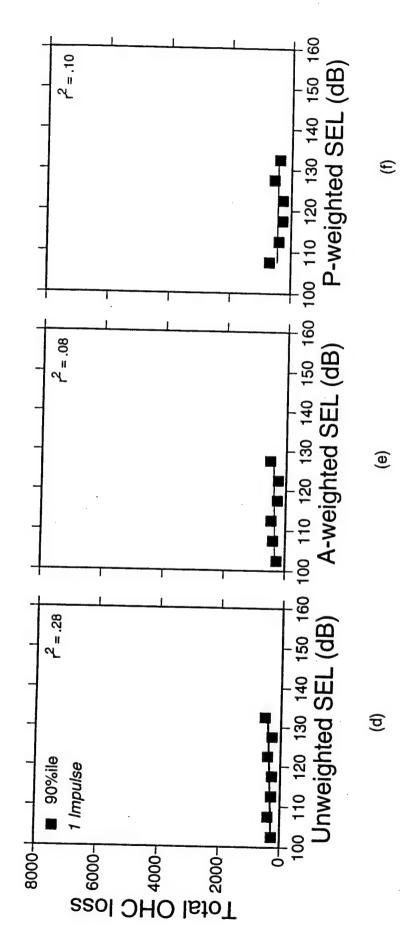


Figure 27 (a-c) The 90th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of determination)



The 90th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted Figure 27 (d-f)

A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 =$ coefficient of determination)

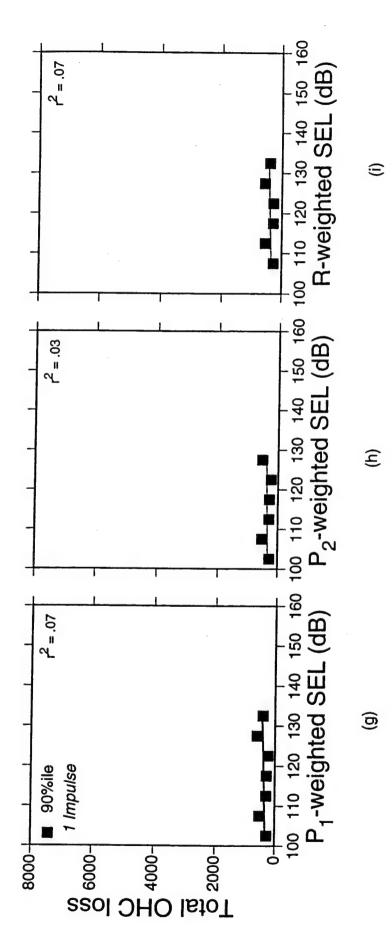


Figure 27 (g-i) The 90th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, the indicated level of the hazard index (g) P1-weighted SEL, (h) P2-weighted SEL, and (i) R-weighted

A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 =$ coefficient of determination)

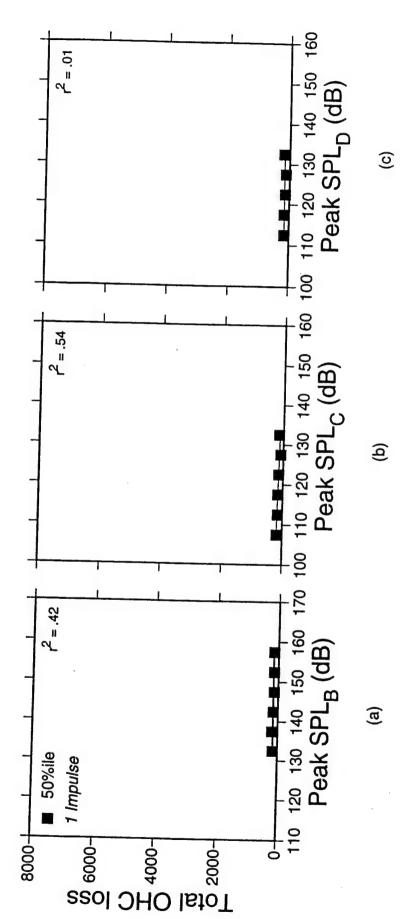


Figure 28 (a-c) The 50th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 = \text{coefficient of}$ determination)

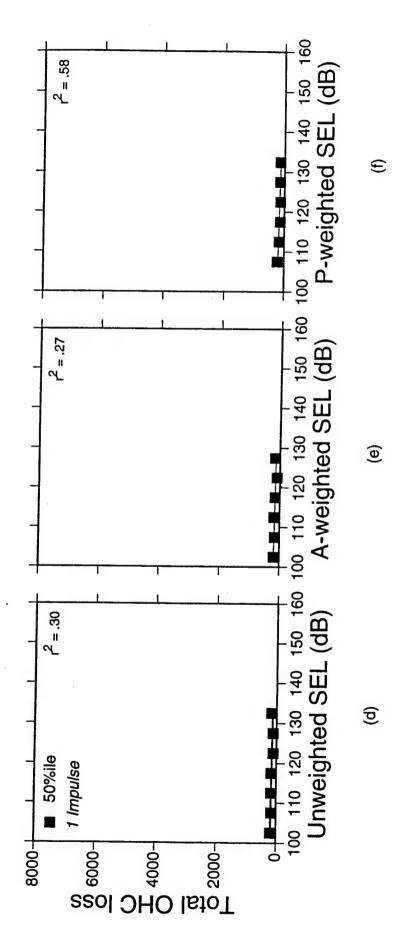
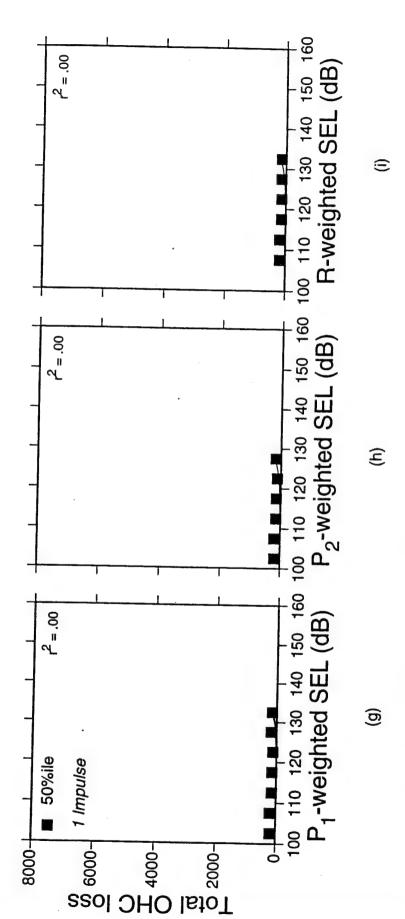


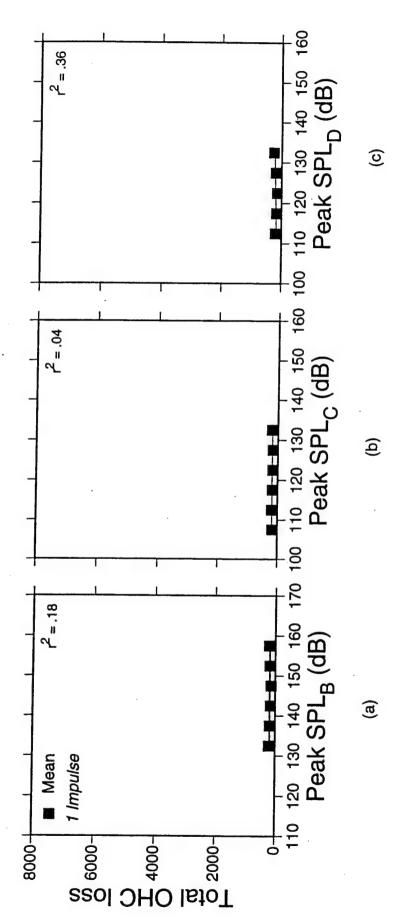
Figure 28 (d-f) The 50th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 =$

coefficient of determination)



The 50th percentile total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. ($r^2 =$ coefficient of determination) Figure 28 (g-i)

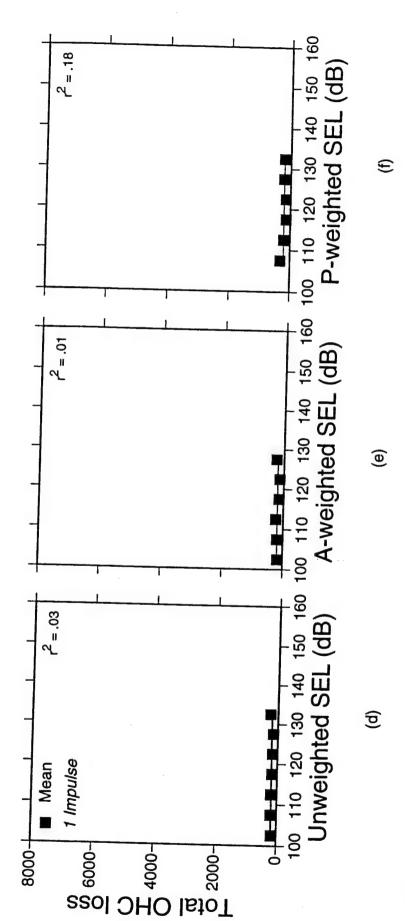
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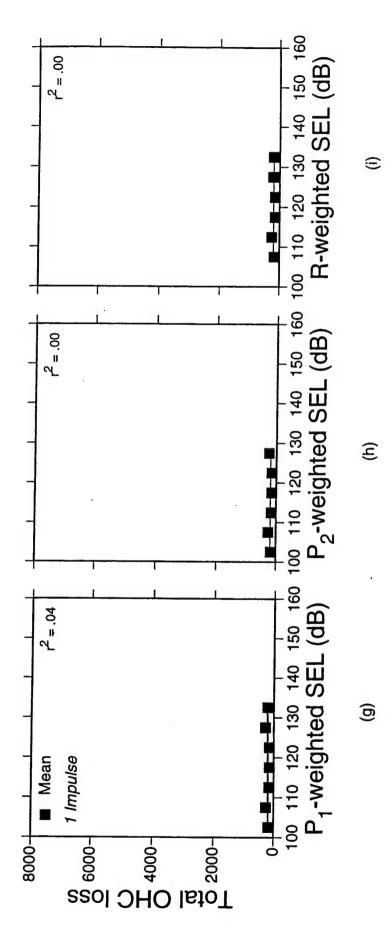
indicated level of the hazard index (a) Peak SPL_B , (b) Peak SPL_C , and (c) Peak SPL_D . The solid line is Figure 29 (a-c) The mean total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of

Equation (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of

determination)



indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of Figure 29 (d-f) The mean total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of the determination)



indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 7. (r^2 = coefficient of The mean total OHC loss for all animals exposed to a single impulse falling within 5 dB bins of the determination) Figure 29 (g-i)

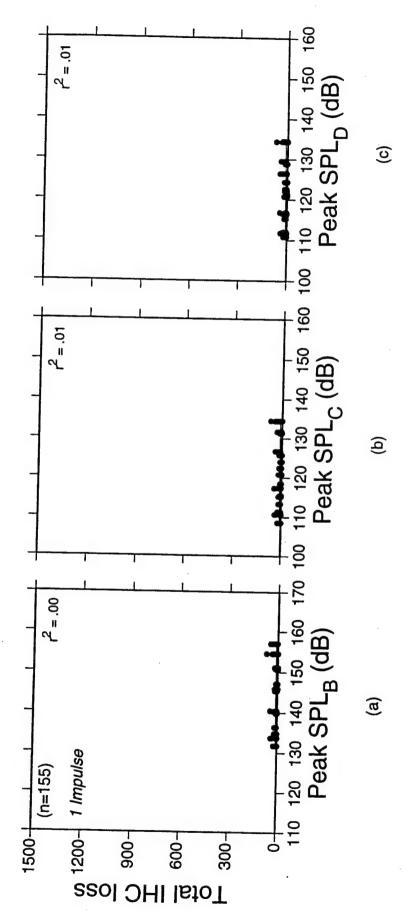
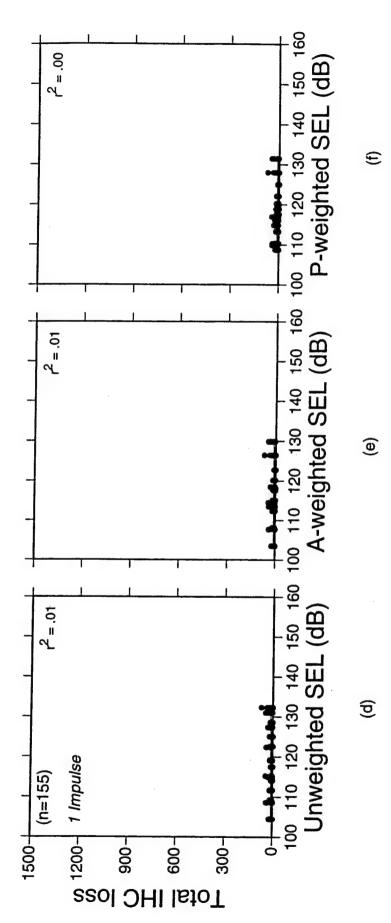
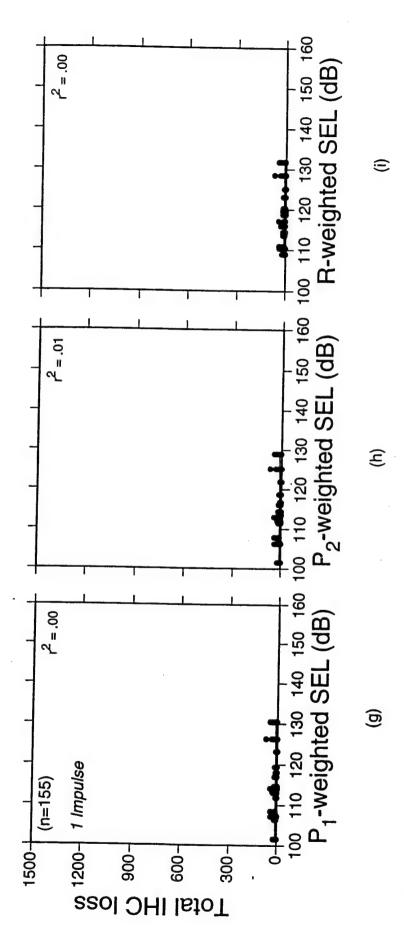


Figure 30 (a-c) Total IHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 8. ($r^2 =$ coefficient of determination)



of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is Total IHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated level the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 8. (r^2 = coefficient of determination) Figure 30 (d-f)



Total IHC loss in the cochlea of each animal exposed to a single impulse (n=155) at the indicated level of the hazard index (g) P1-weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 8. (r^2 = coefficient of determination) Figure 30 (g-i)

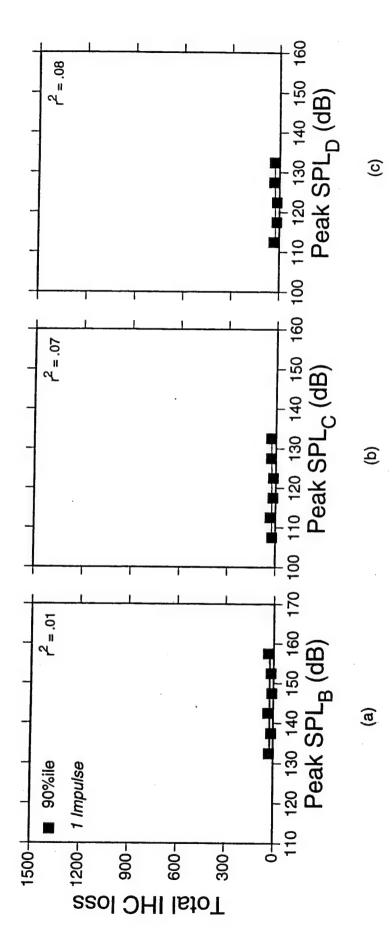
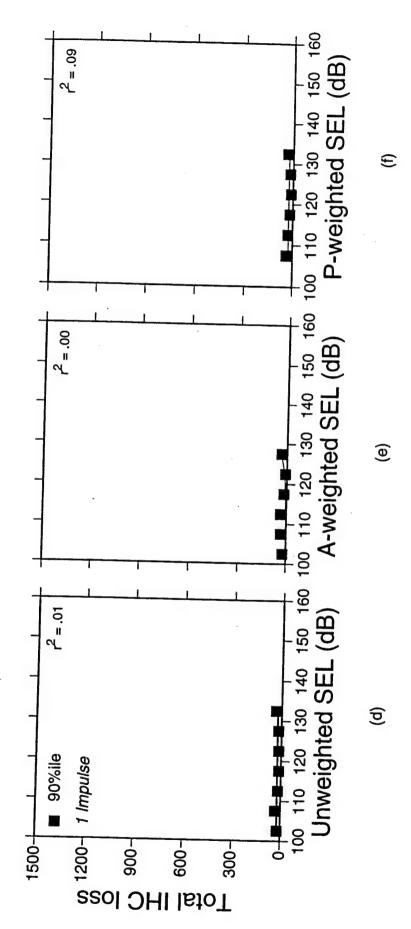


Figure 31 (a-c) The 90th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The and C of Equation (20) corresponding to each regression line are listed in Table 8. (r^2 = coefficient solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, of determination)



The 90th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-Figure 31 (d-f)

8. $(r^2 = coefficient of determination)$

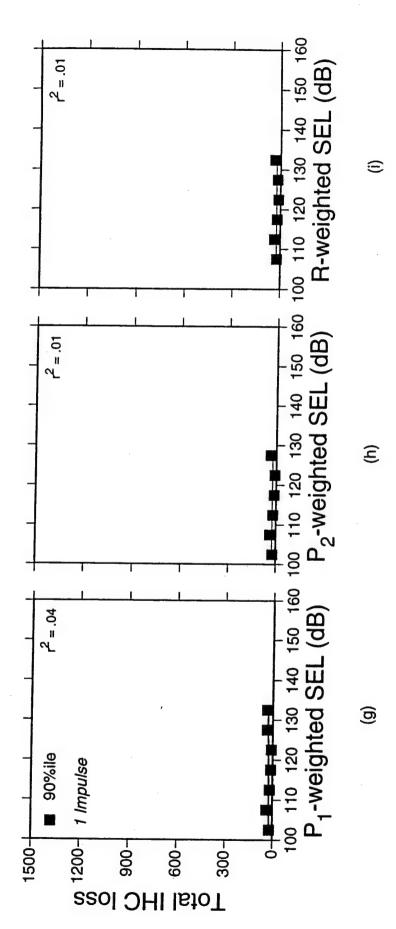


Figure 31 (g-i) The 90th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-

8. (r² = coefficient of determination)

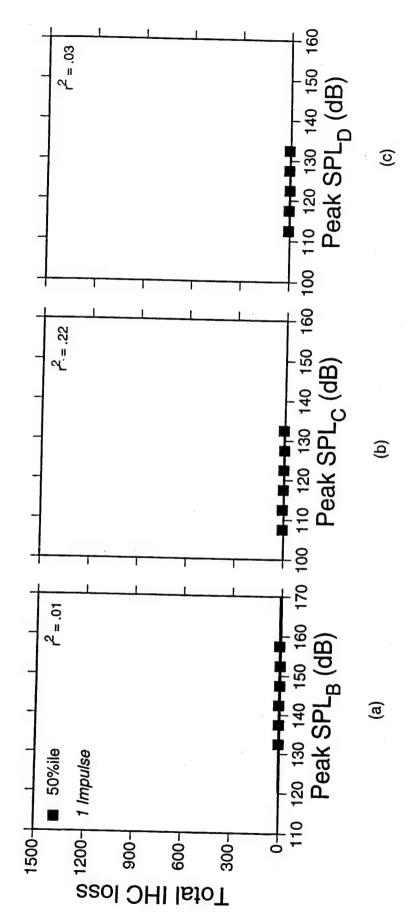


Figure 32 (a-c) The 50th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The and C of Equation (20) corresponding to each regression line are listed in Table 8. (r^2 = coefficient solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, of determination)

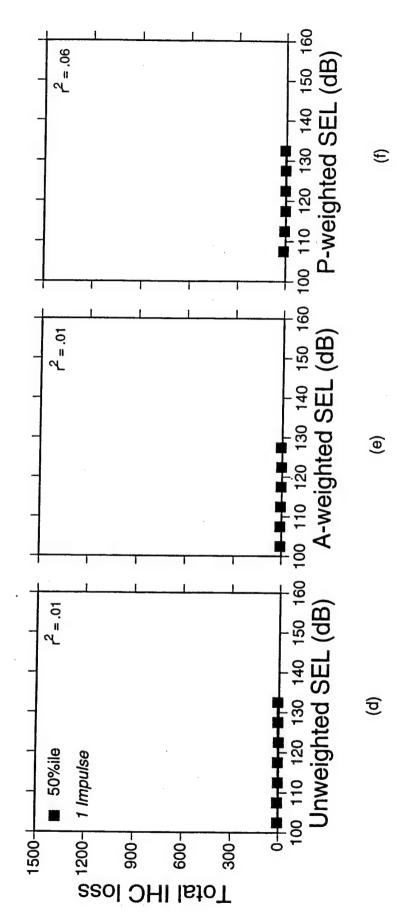
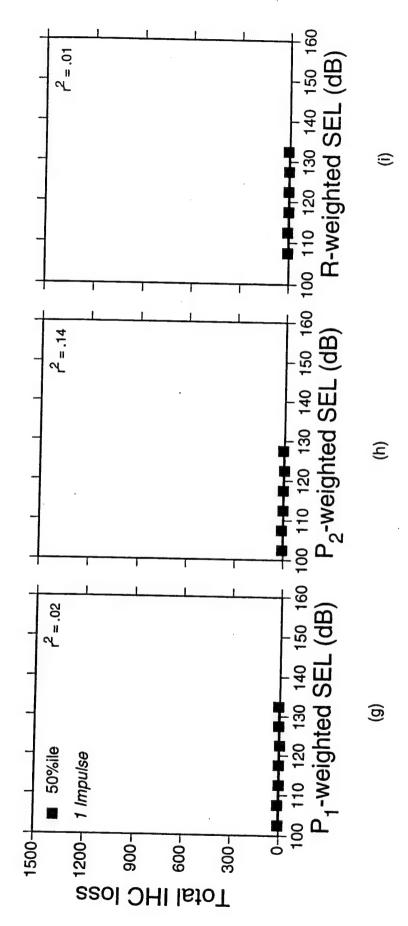
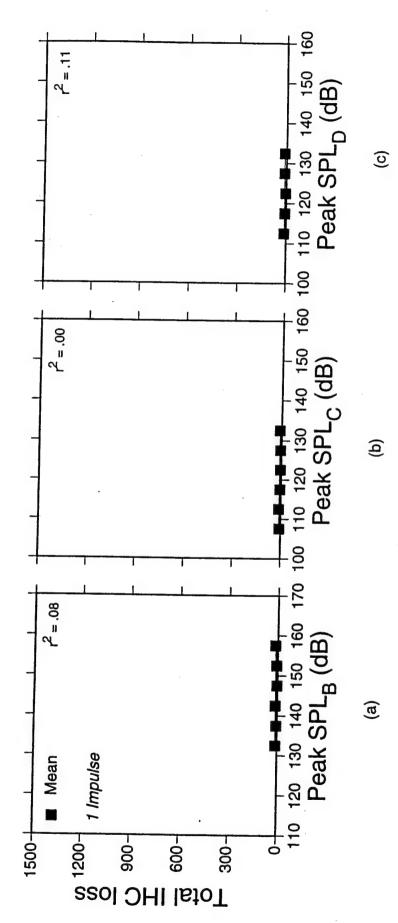


Figure 32 (d-f) The 50th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-

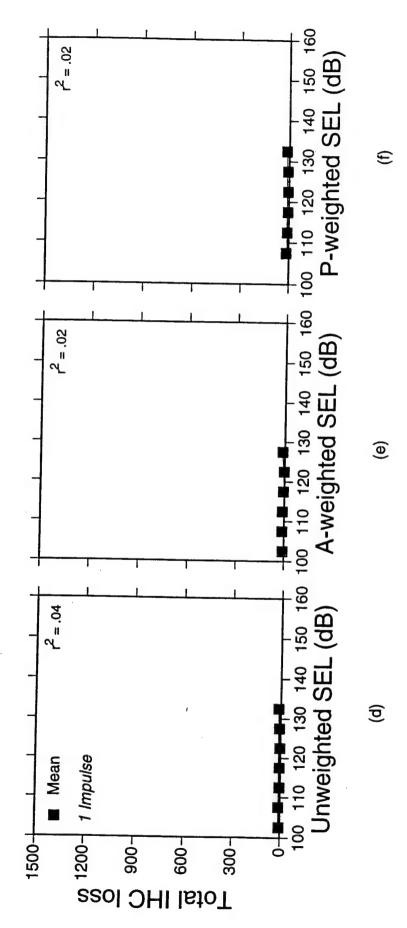
8. $(r^2 = coefficient of determination)$



The 50th percentile total IHC loss for all animals exposed to a single impulse falling within 5 dB bins weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-8. (r^2 = coefficient of determination) Figure 32 (g-i)

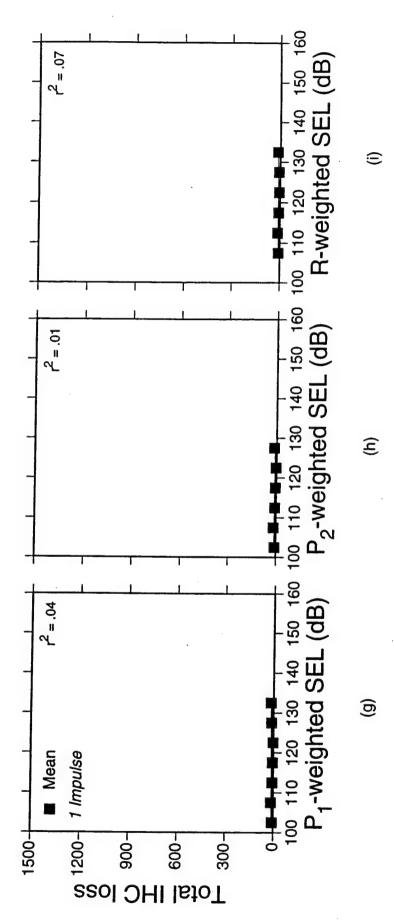


line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C Figure 33 (a-c) The mean total IHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid of Equation (20) corresponding to each regression line are listed in Table 8. (r^2 = coefficient of determination)



parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table The mean total IHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three Figure 33 (d-f)

8. (r² = coefficient of determination)



parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table The mean total IHC loss for all animals exposed to a single impulse falling within 5 dB bins of the indicated level of the hazard index (g) P1-weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three Figure 33 (g-i)

8. (r^2 = coefficient of determination)

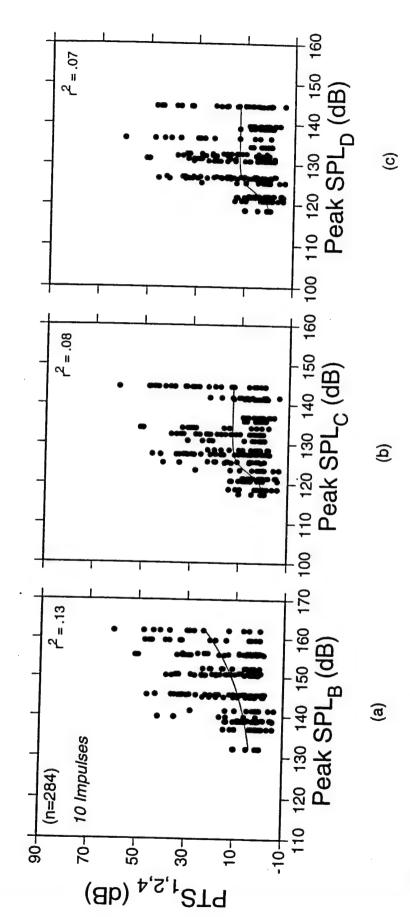


Figure 34 (a-c) Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal exposed to 10 impulses (n=284) at the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. (r^2 = coefficient of determination)

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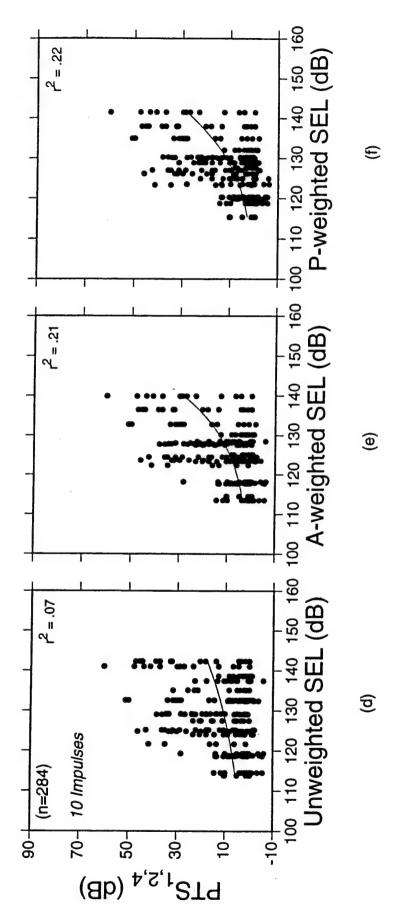
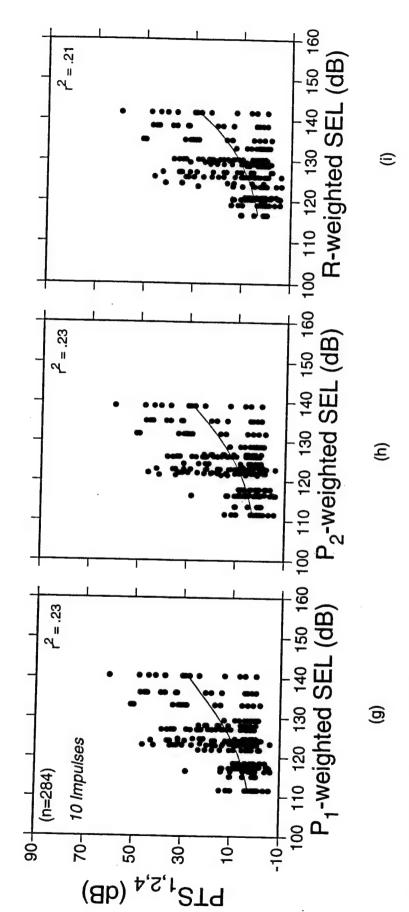
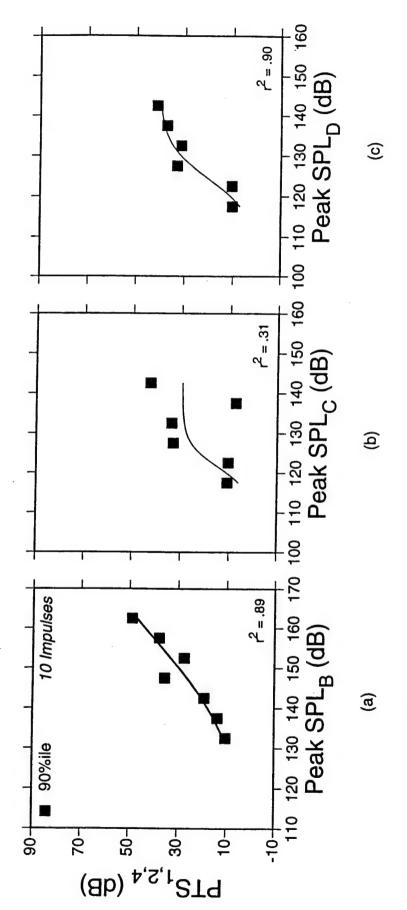


Figure 34 (d-f) Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal exposed to 10 impulses (n=284) at the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) Pparameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three $(r^2 = coefficient of determination)$



Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal exposed to 10 impulses (n=284) at the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) Rparameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three $(r^2 = coefficient of determination)$ Figure 34 (g-i)



 SPL_B , (b) Peak SPL_C , and (c) Peak SPL_D . The solid line is the nonlinear regression fit of Equation Figure 35 (a-c) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. (r^2 = coefficient of determination)

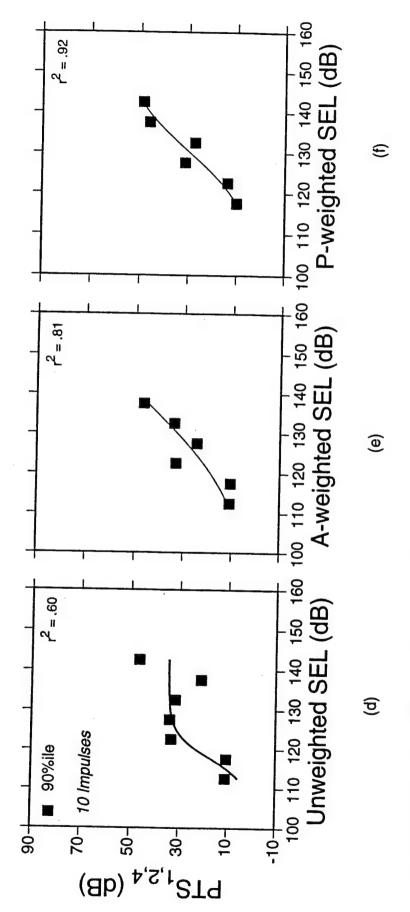
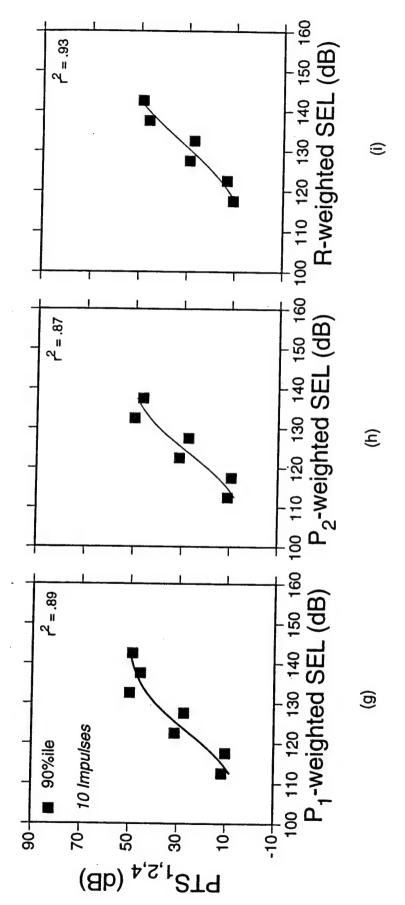
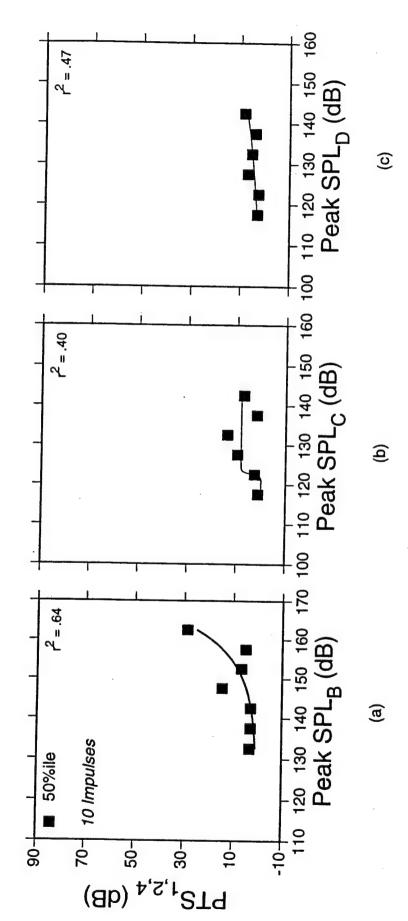


Figure 35 (d-f) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear corresponding to each regression line are listed in Table 9. ($r^2 = \text{coefficient of determination}$) exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d)



weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 each regression line are listed in Table 9. ($r^2 = \text{coefficient of determination}$) Figure 35 (g-i)



SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Equation exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak Figure 36 (a-c) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. ($r^2 = \text{coefficient of determination}$)

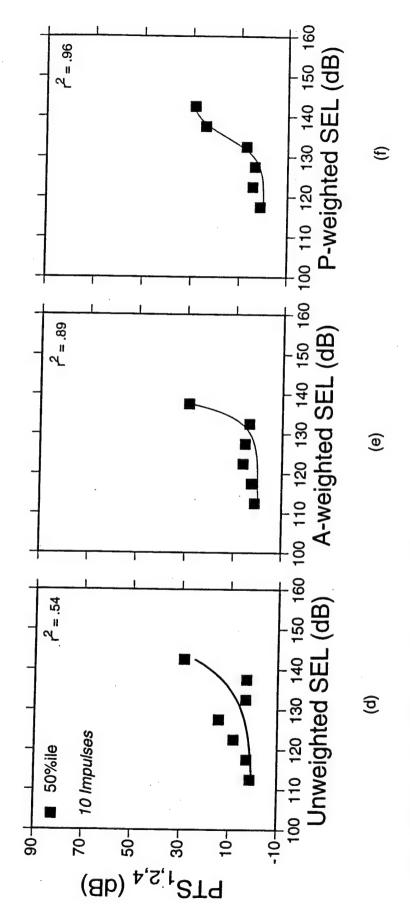
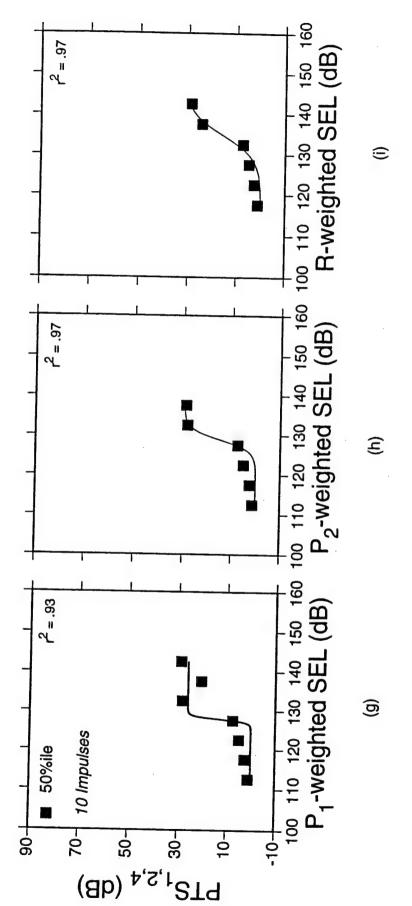


Figure 36 (d-f) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear corresponding to each regression line are listed in Table 9. (r^2 = coefficient of determination) exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d)



weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) $P_{_1}$ each regression line are listed in Table 9. ($r^2 = \text{coefficient of determination}$) Figure 36 (g-i)

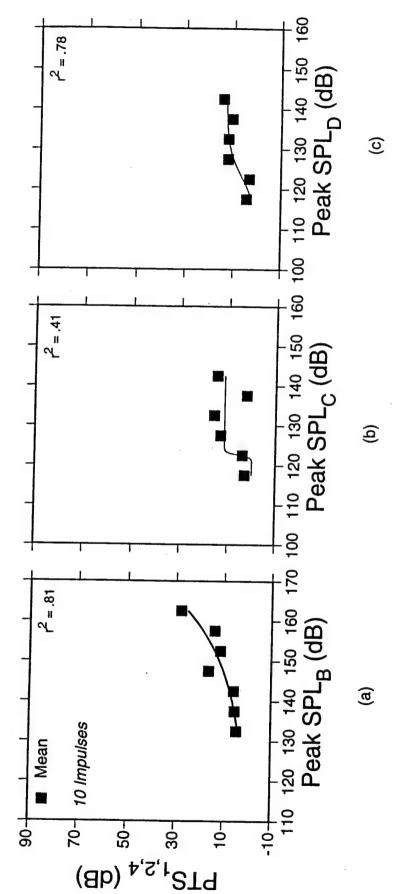
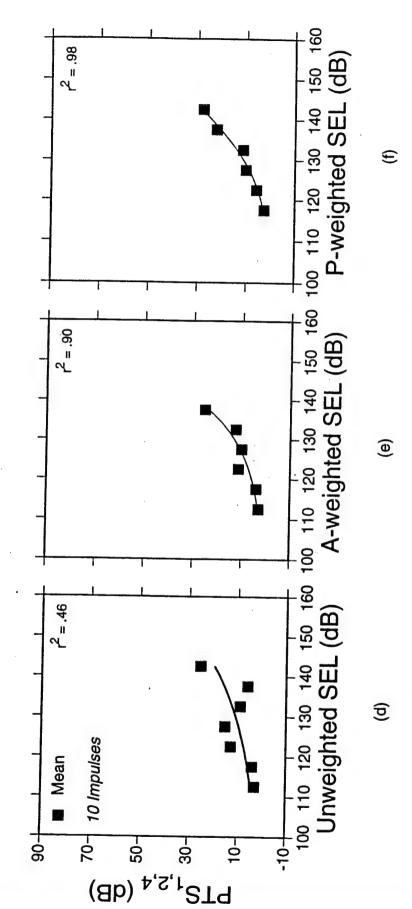


Figure 37 (a-c) The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the 10 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B, (b) data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. (r^2 = coefficient of determination)



The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 10 weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) Athe data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. (r2 = coefficient of determination) Figure 37 (d-f)

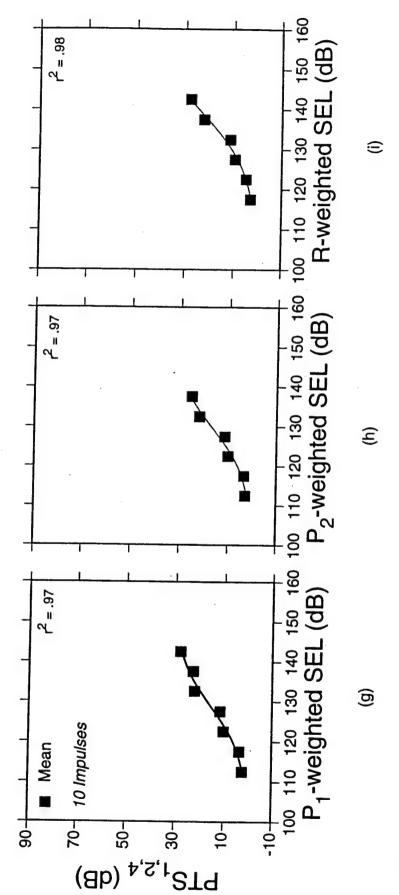
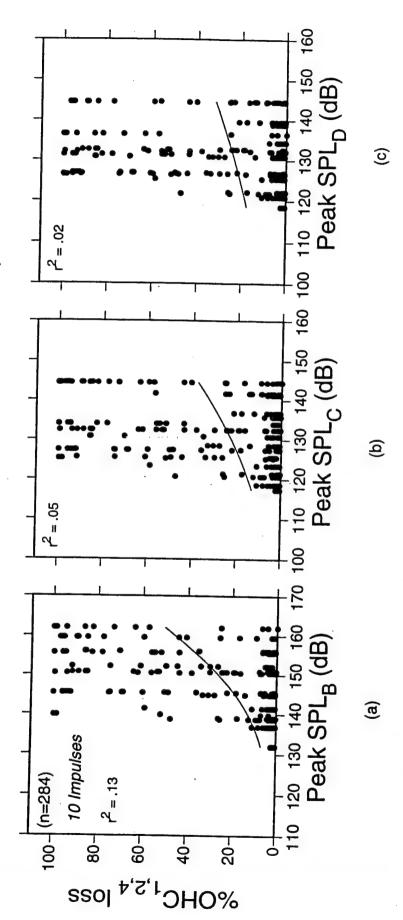
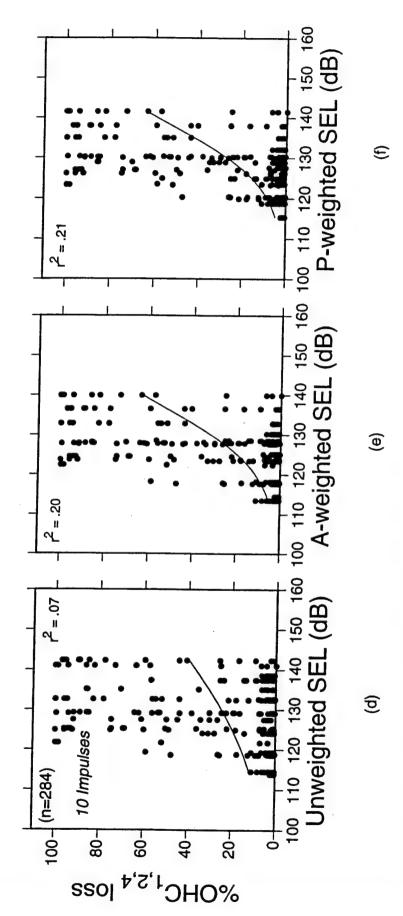


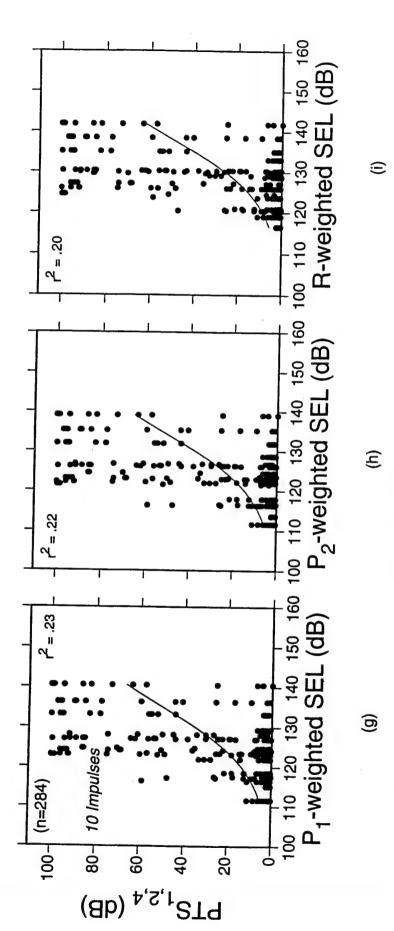
Figure 37 (g-i) The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 10 weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 9. (r2 = coefficient of determination)



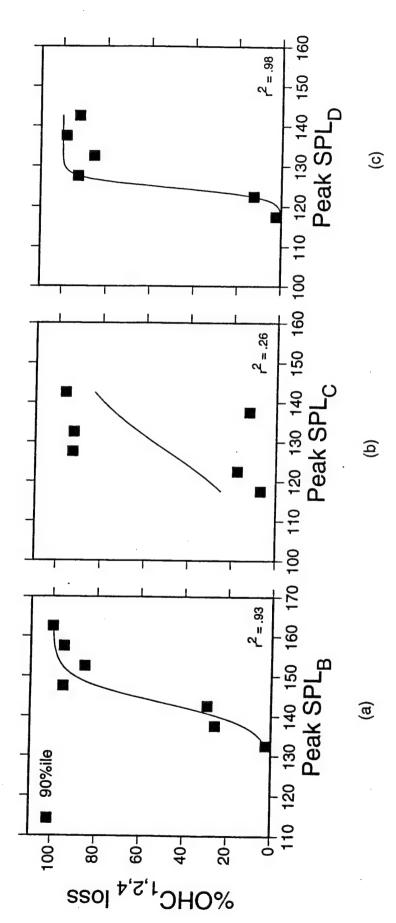
the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to animals exposed to 10 impulses (n=284) at the indicated level of the hazard index (a) Peak SPL_B, Figure 38 (a-c) The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all are listed in Table 10. (r2 = coefficient of determination)



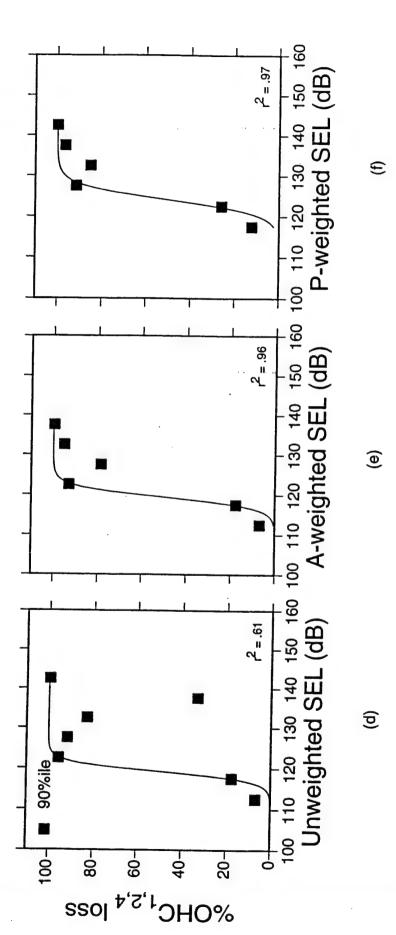
Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each animals exposed to 10 impulses (n=284) at the indicated level of the hazard index (d) Unweighted The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$) Figure 38 (d-f)



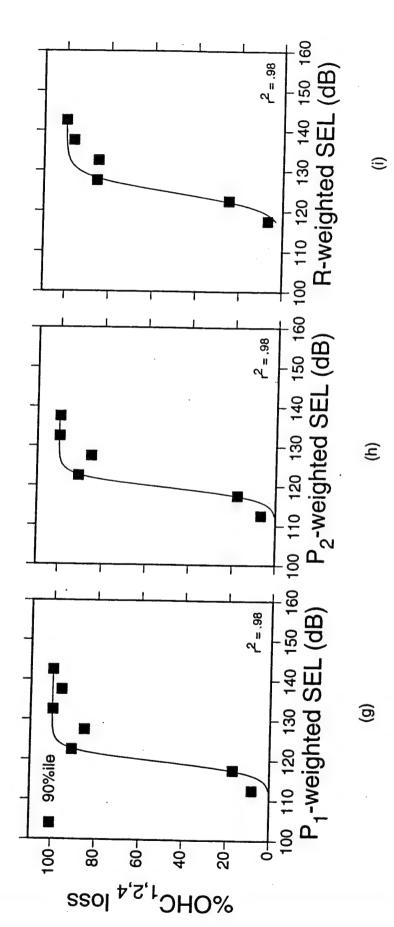
animals exposed to 10 impulses (n=284) at the indicated level of the hazard index (g) P1-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all each regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$) Figure 38 (g-i)



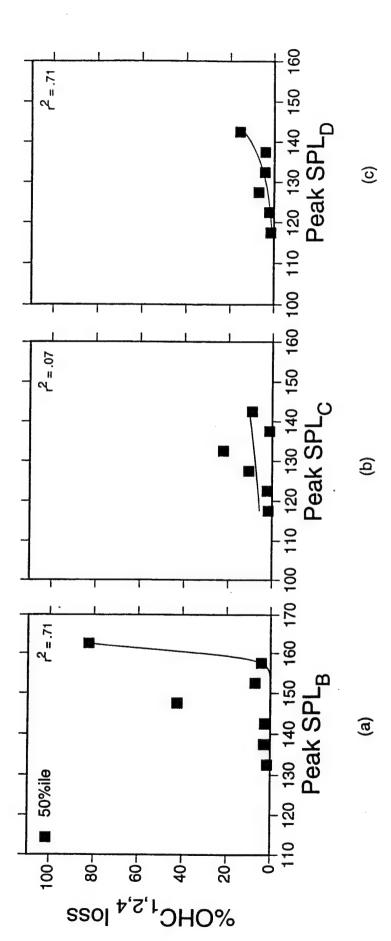
for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Figure 39 (a-c) The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$)



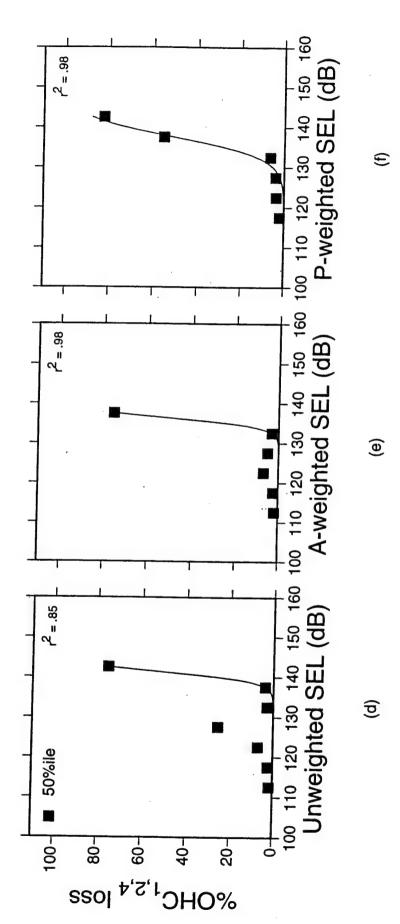
fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d) The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$) Figure 39 (d-f)



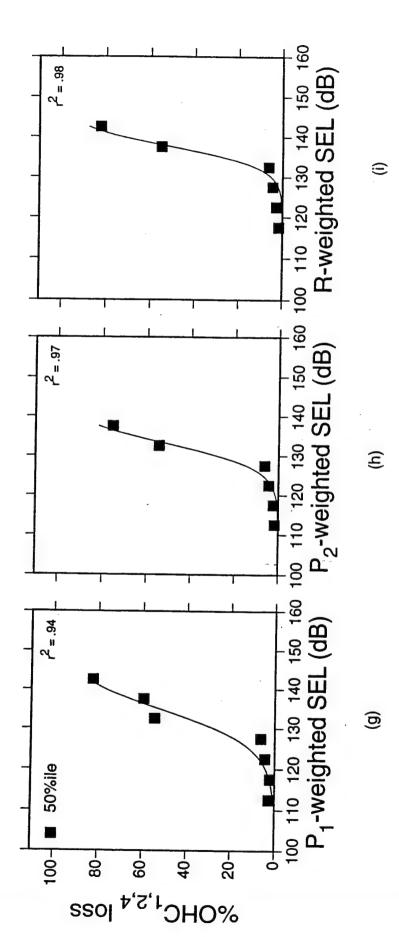
all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) $P_{
m 1}$ weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for Figure 39 (g-i) The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$)



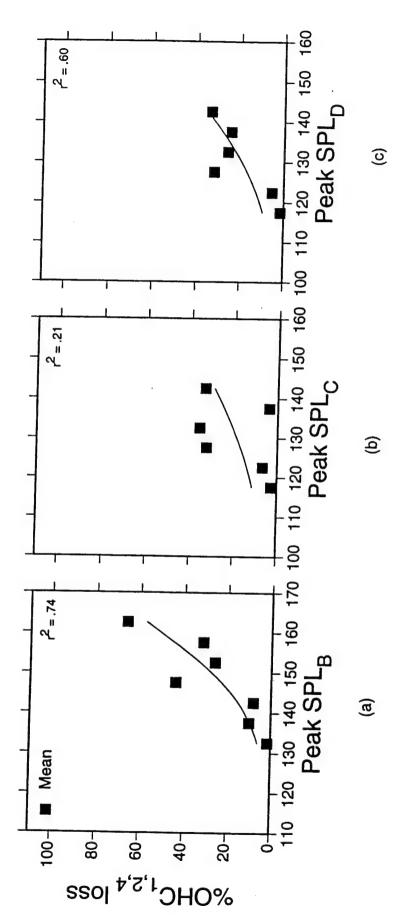
for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit of Figure 40 (a-c) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = coefficient$ of determination)



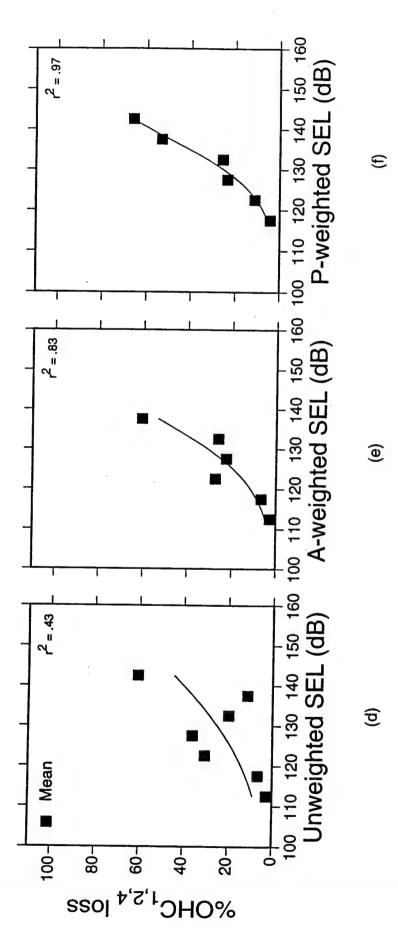
fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = \text{coefficient of determination}$) Figure 40 (d-f)



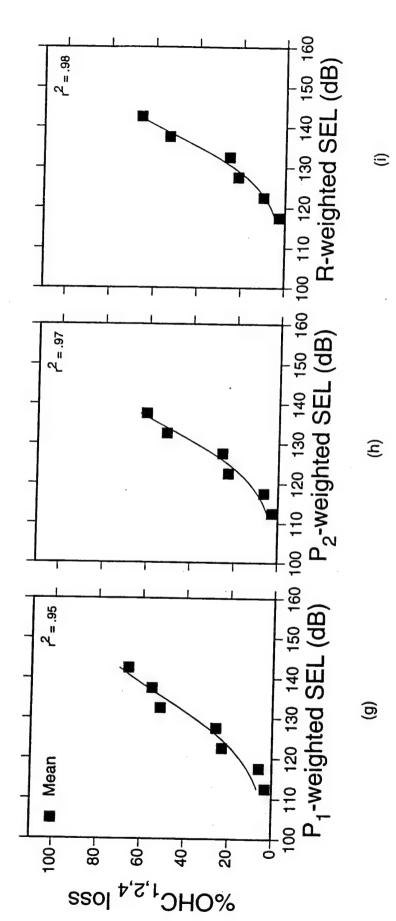
all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P₁weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. (r^2 = coefficient of determination) Figure 40 (g-i)



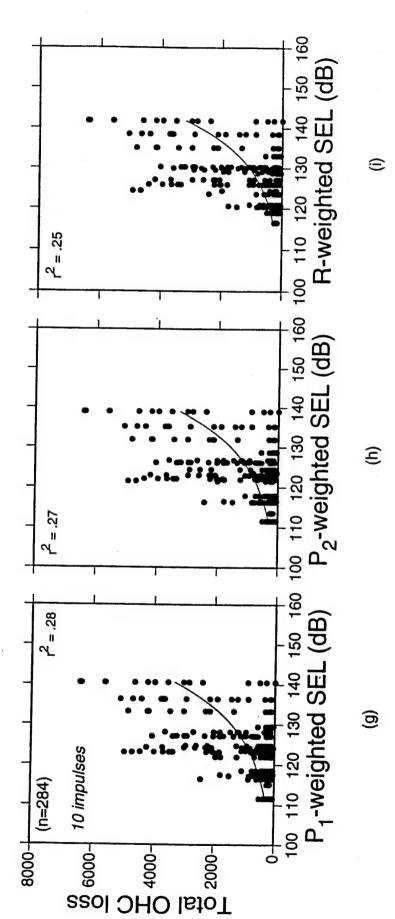
Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Figure 41 (a-c) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of regression line are listed in Table 10. (r^2 = coefficient of determination)



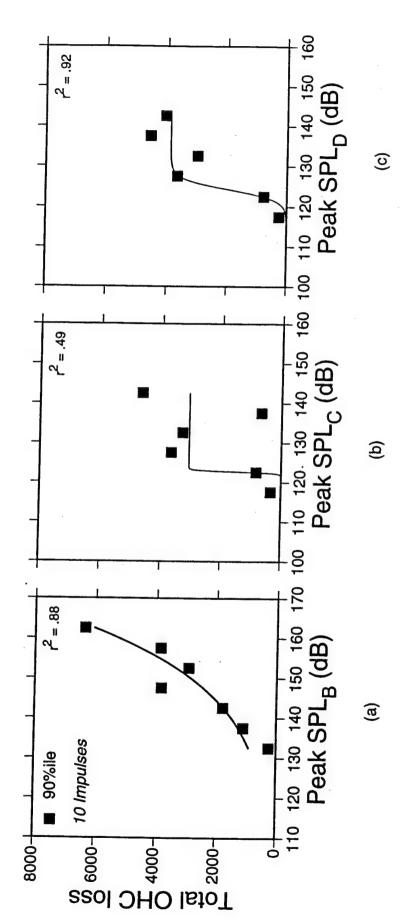
at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to Figure 41 (d-f) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) Athe data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to listed in Table 10. (r^2 = coefficient of determination)



at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -Figure 41 (g-i) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to listed in Table 10. (r^2 = coefficient of determination)

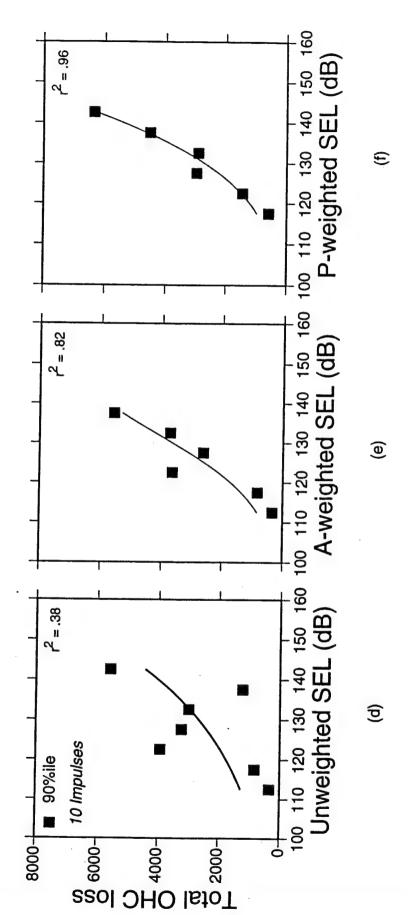


Total OHC loss in the cochlea of each animal exposed to 10 impulses (n=284) at the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of determination) Figure 42 (g-i)

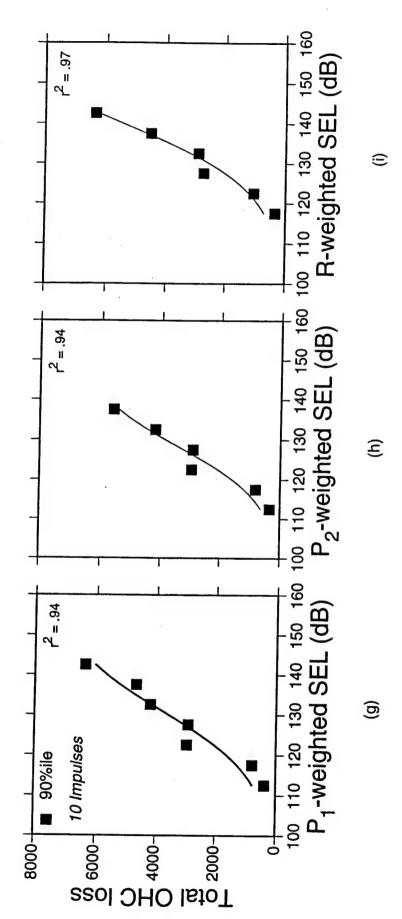


indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is Figure 43 (a-c) The 90th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of

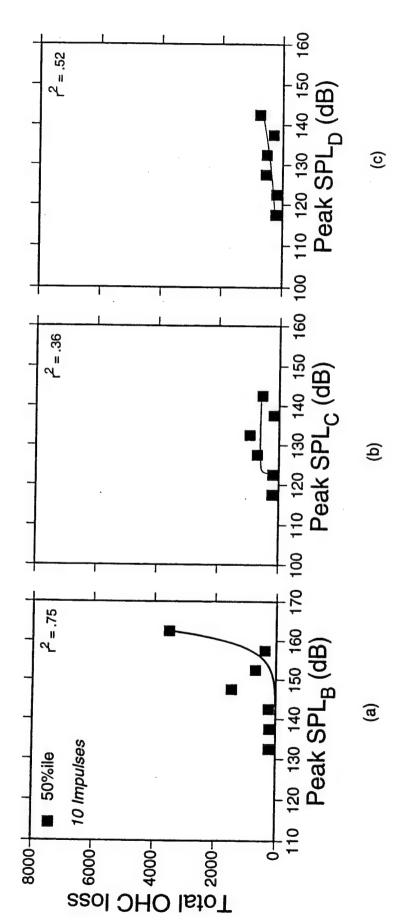
determination)



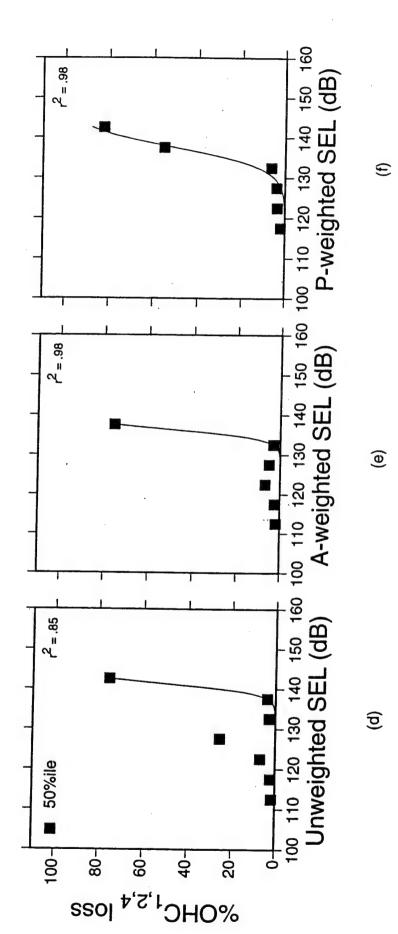
The 90th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 43 (d-f)



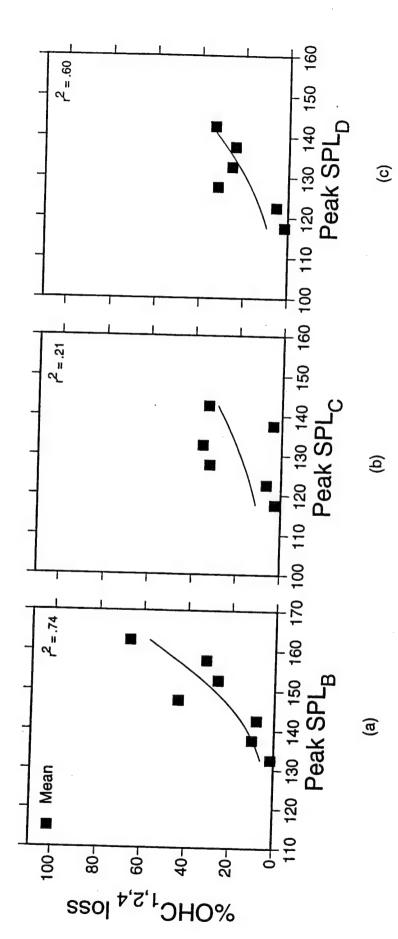
The 90th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 43 (g-i)



indicated level of the hazard index (a) Peak SPL_B , (b) Peak SPL_C , and (c) Peak SPL_D . The solid line is Figure 44 (a-c) The 50th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of determination)

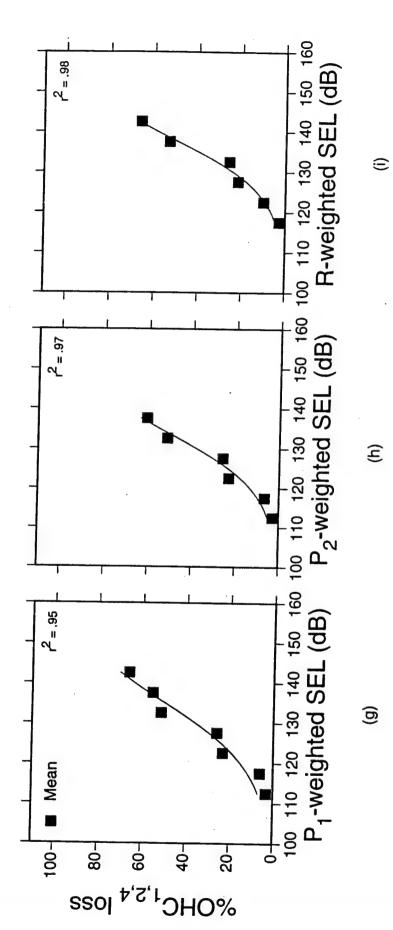


fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (d) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 10. ($r^2 = coefficient$ of determination) Figure 40 (d-f)



Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Figure 41 (a-c) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of

regression line are listed in Table 10. (r^2 = coefficient of determination)



at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to listed in Table 10. (r^2 = coefficient of determination) Figure 41 (g-i)

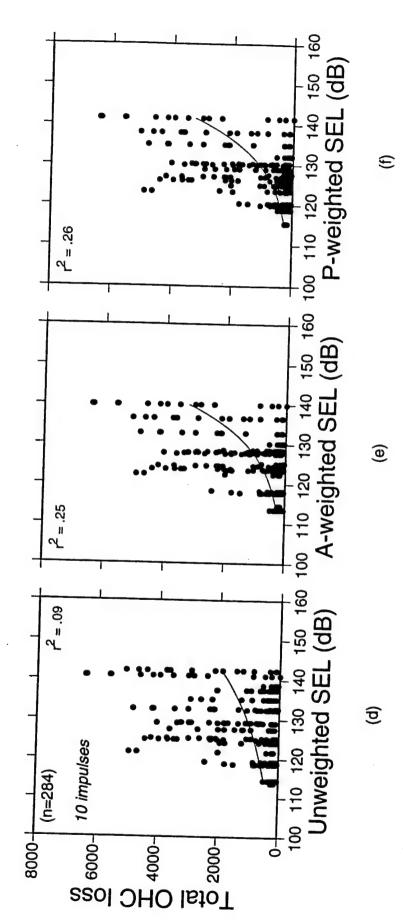
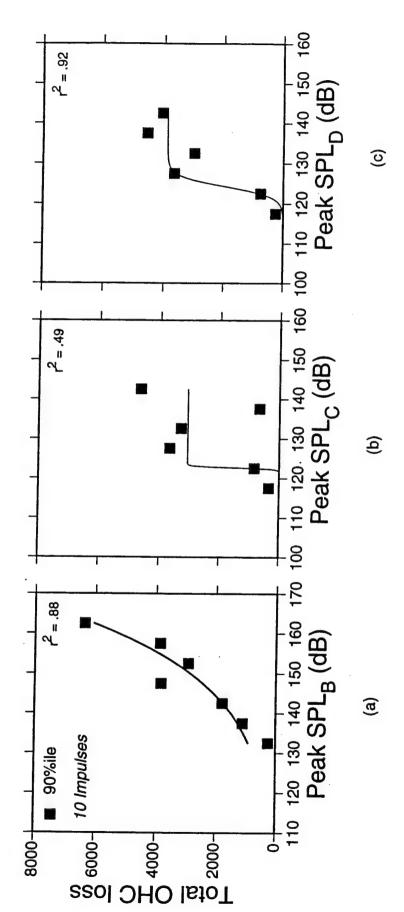
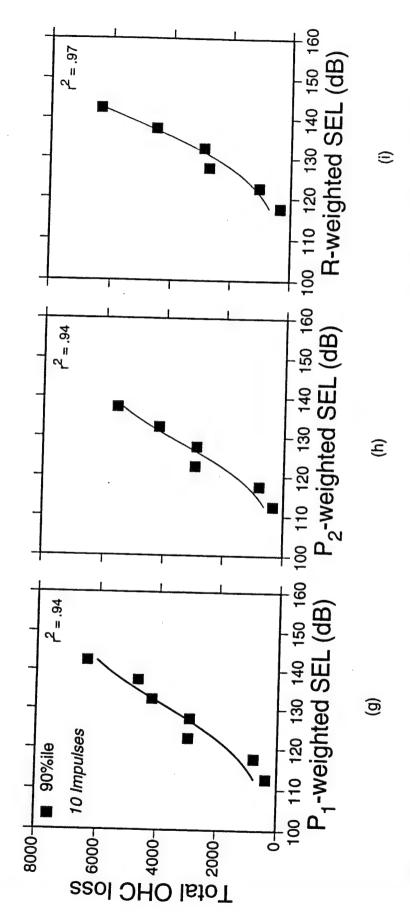


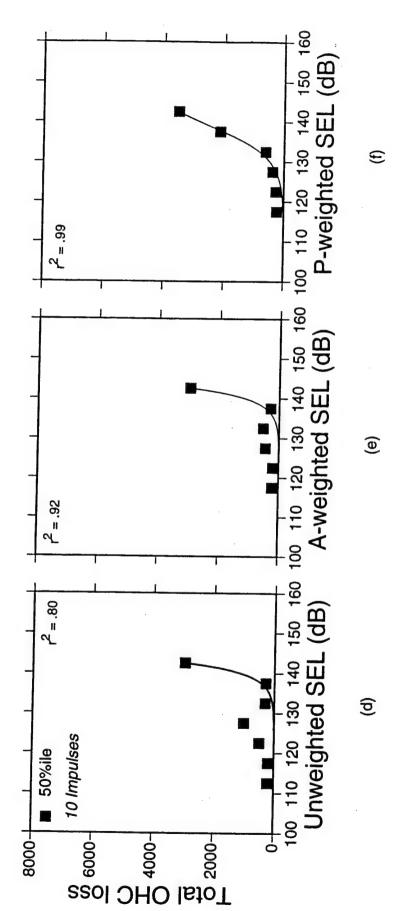
Figure 42 (d-f) Total OHC loss in the cochlea of each animal exposed to 10 impulses (n=284) at the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 11. ($r^2 = \text{coefficient of}$ determination)



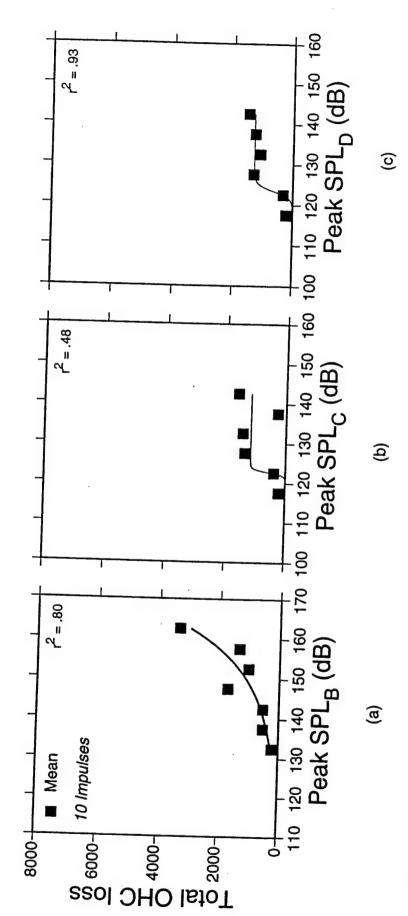
indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is Figure 43 (a-c) The 90th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 11. ($r^2 = \text{coefficient of}$ determination)



The 90th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 43 (g-i)

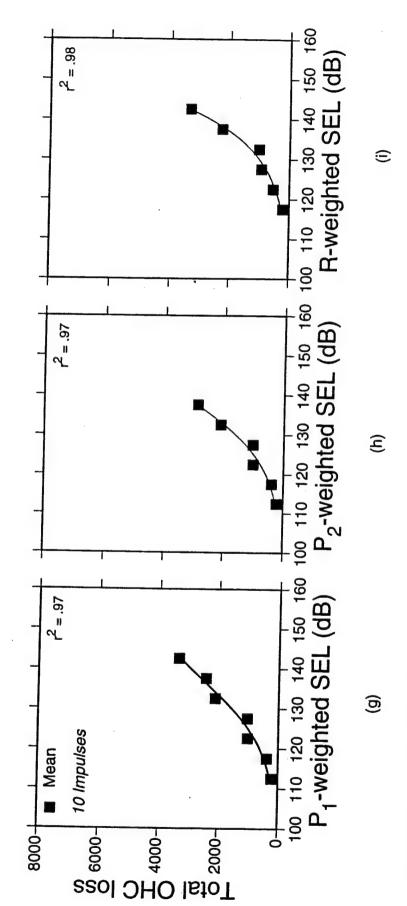


The 50th percentile total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 44 (d-f)

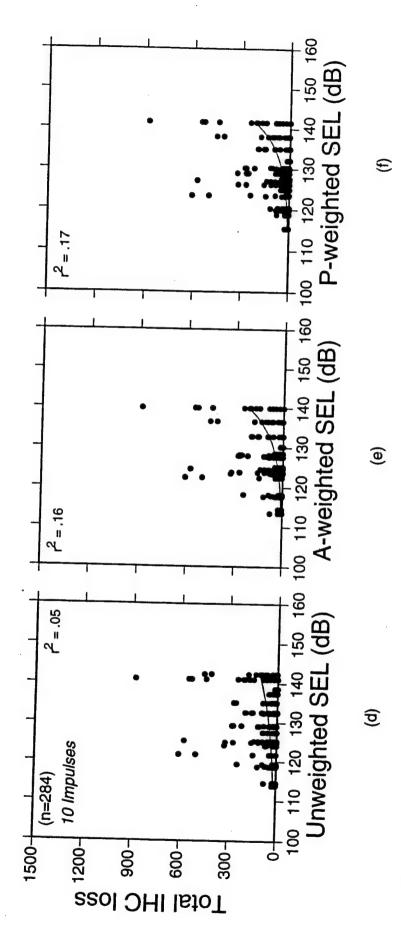


indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is Figure 45 (a-c) The mean total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of

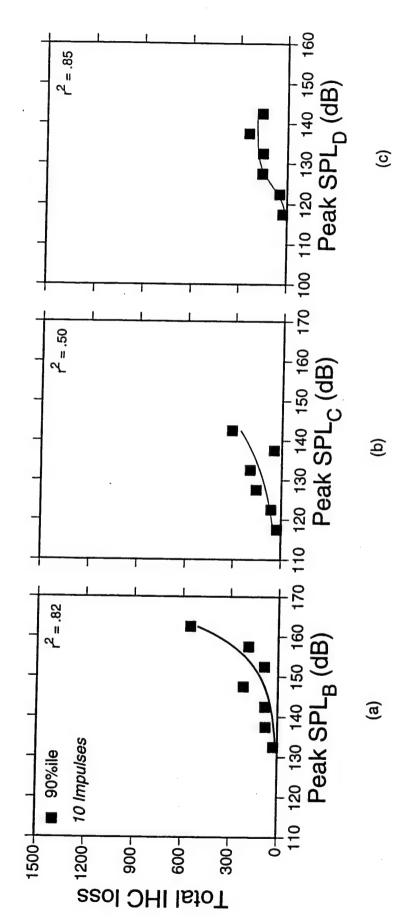
Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of determination)



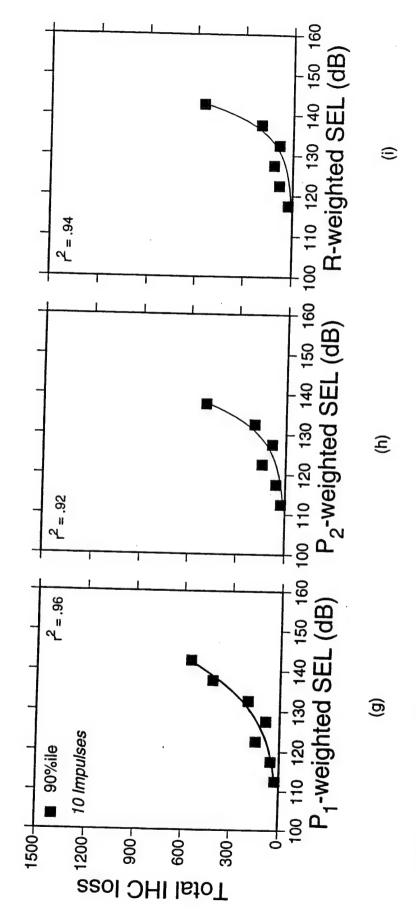
indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. and C of Equation (20) corresponding to each regression line are listed in Table 11. (r^2 = coefficient of The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, Figure 45 (g-i) The mean total OHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the determination)



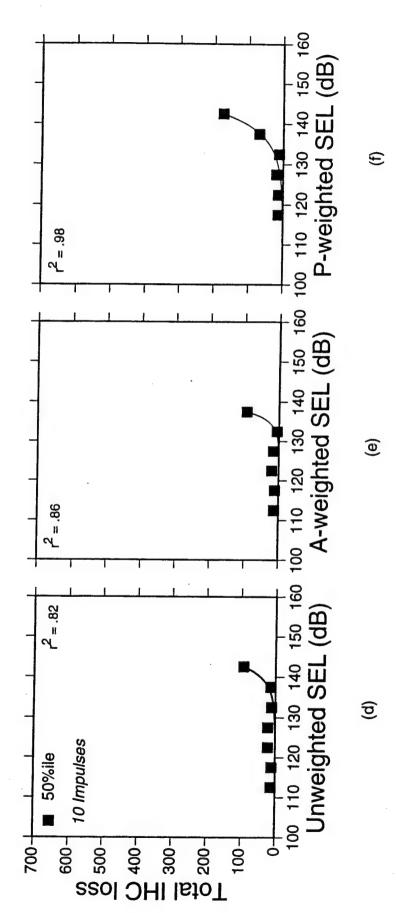
the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is Figure 46 (d-f) Total IHC loss in the cochlea of each animal exposed to10 impulses (n=284) at the indicated level of the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 12. ($r^2 = \text{coefficient of}$ determination)



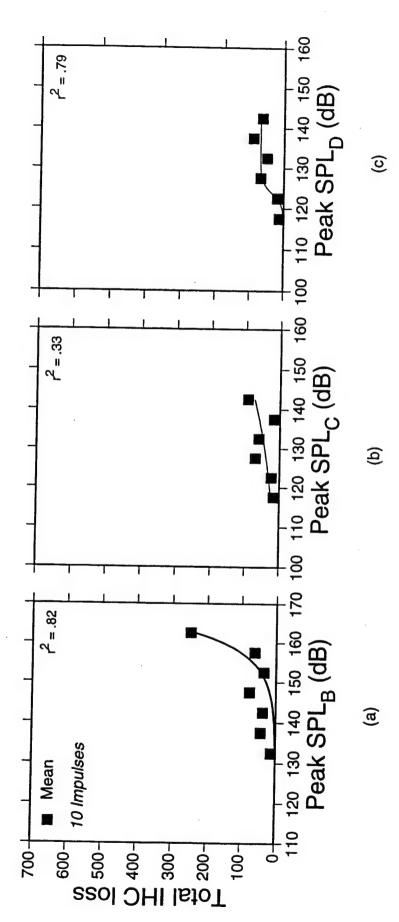
and C of Equation (20) corresponding to each regression line are listed in Table 12. (r^2 = coefficient Figure 47 (a-c) The 90th percentile total IHC loss for all animals exposed to 10 impulses falling within 5 dB bins of solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, the indicated level of the hazard index (a) Peak SPL $_{\rm B}$, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The of determination)



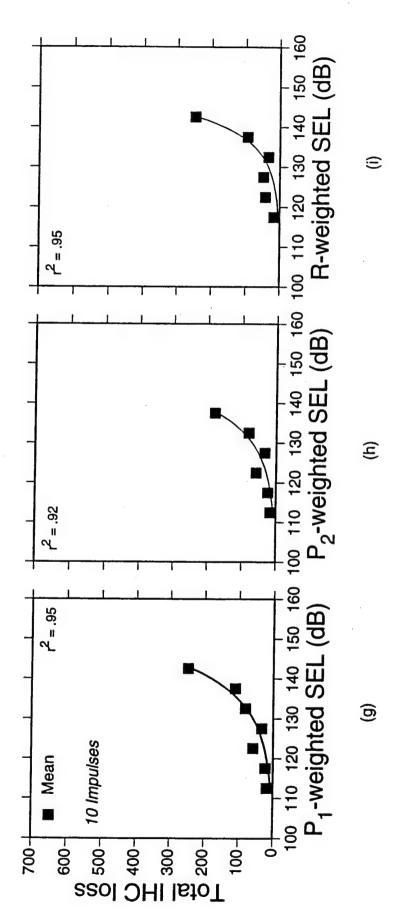
indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The 90th percentile total IHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the and C of Equation (20) corresponding to each regression line are listed in Table 12. ($r^2 = \text{coefficient of}$ The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 47 (g-i)



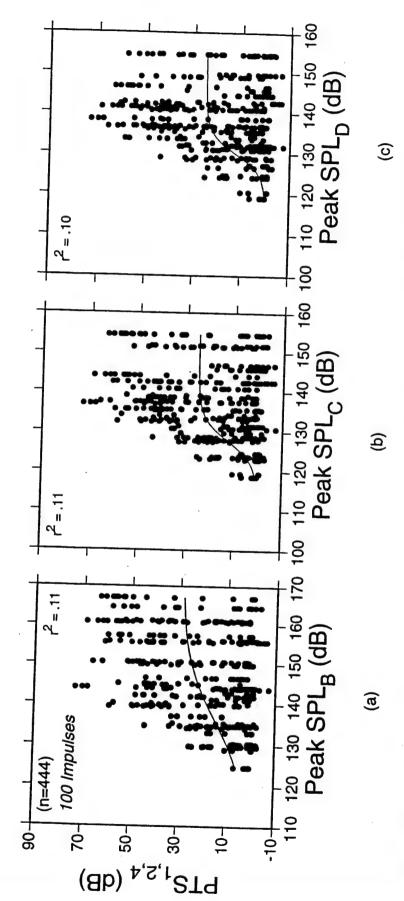
The 50th percentile total IHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the and C of Equation (20) corresponding to each regression line are listed in Table 12. (r² = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 48 (d-f)



line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C indicated level of the hazard index (a) Peak SPL $_{
m R}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid of Equation (20) corresponding to each regression line are listed in Table 12. (r^2 = coefficient of Figure 49 (a-c) The mean total IHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the determination)

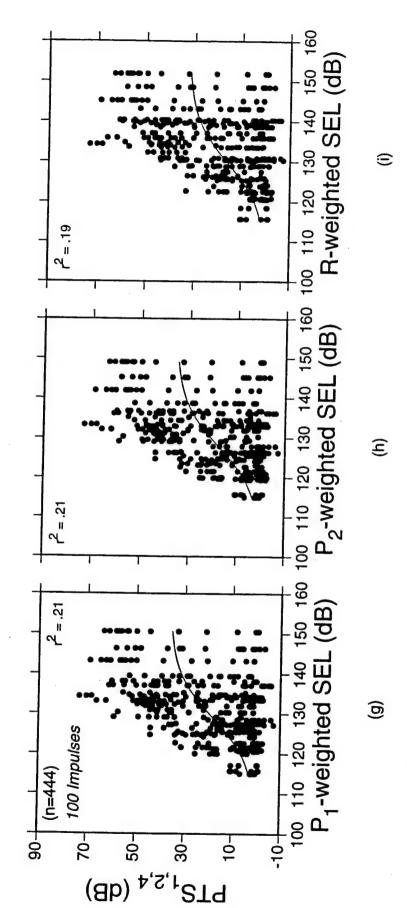


solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C The mean total IHC loss for all animals exposed to 10 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The of Equation (20) corresponding to each regression line are listed in Table 12. (r^2 = coefficient of determination) Figure 49 (g-i)



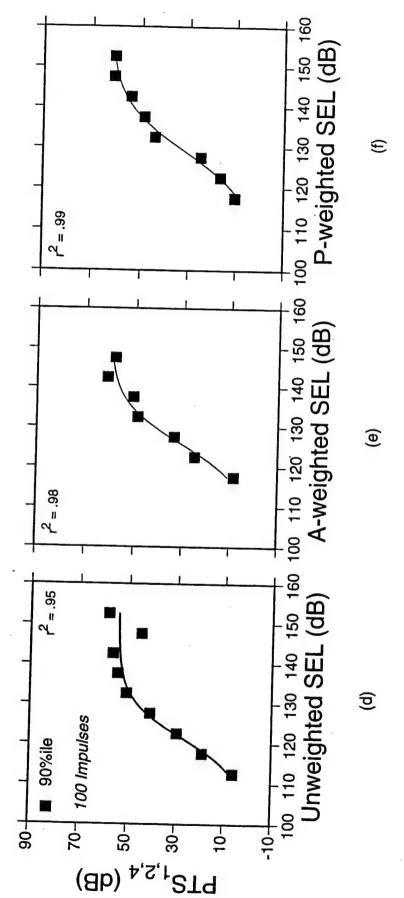
parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 13. impulses (n=444) at the indicated level of the hazard index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three Figure 50 (a-c) Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal exposed to 100

 $(r^2 = coefficient of determination)$

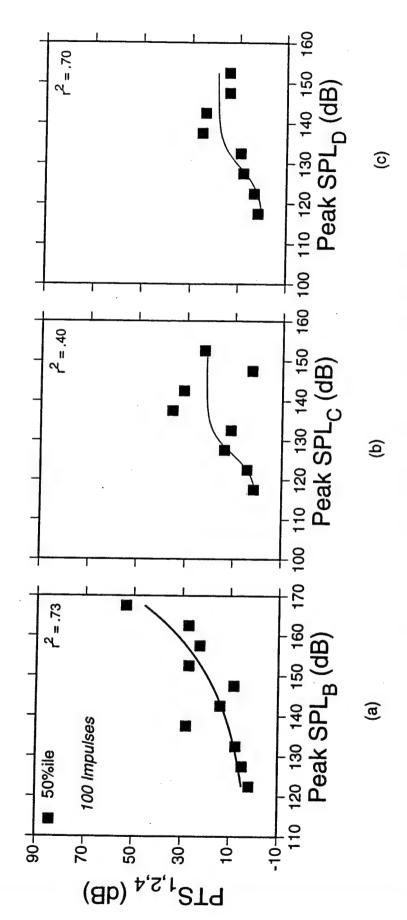


impulses (n=444) at the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Average PTS measured at the 1, 2, and 4 kHz test frequencies of each animal exposed to 100 Figure 50 (g-i)

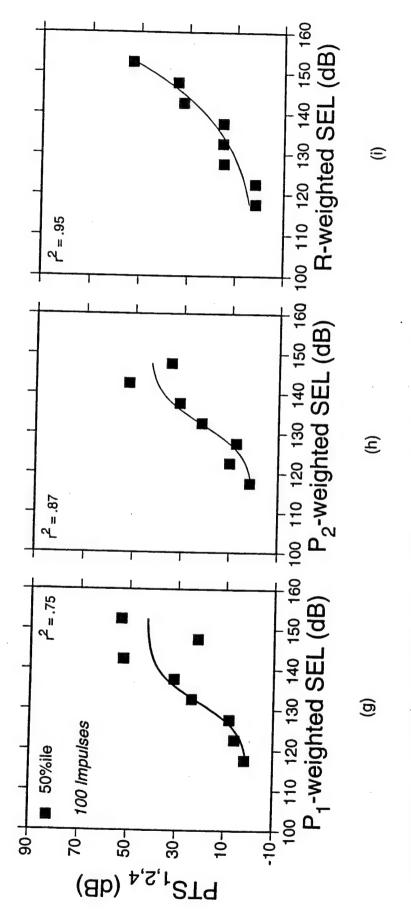
Table 13. (r^2 = coefficient of determination)



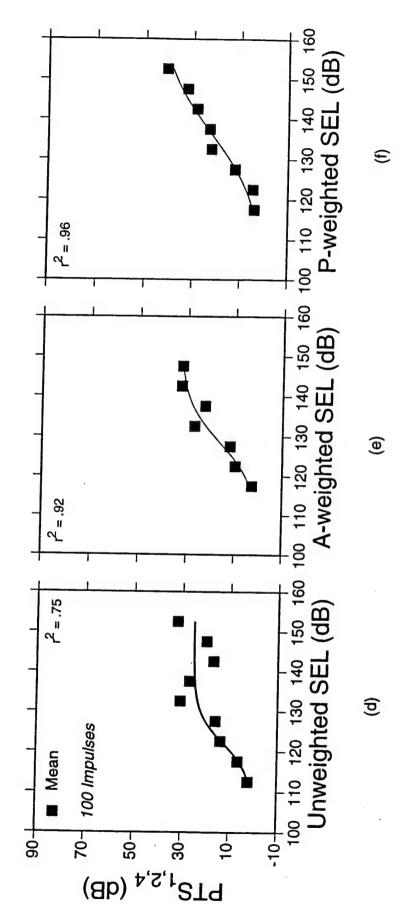
The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear corresponding to each regression line are listed in Table 13. (r^2 = coefficient of determination) exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Figure 51 (d-f)



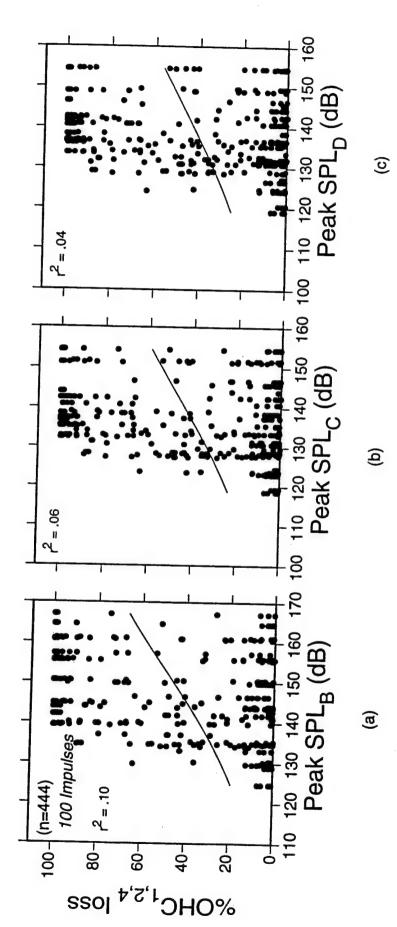
exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL_B , (b) Peak SPL_C , and (c) Peak SPL_D . The solid line is the nonlinear regression fit of Equation Figure 52 (a-c) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 13. ($r^2 = \text{coefficient of determination}$)



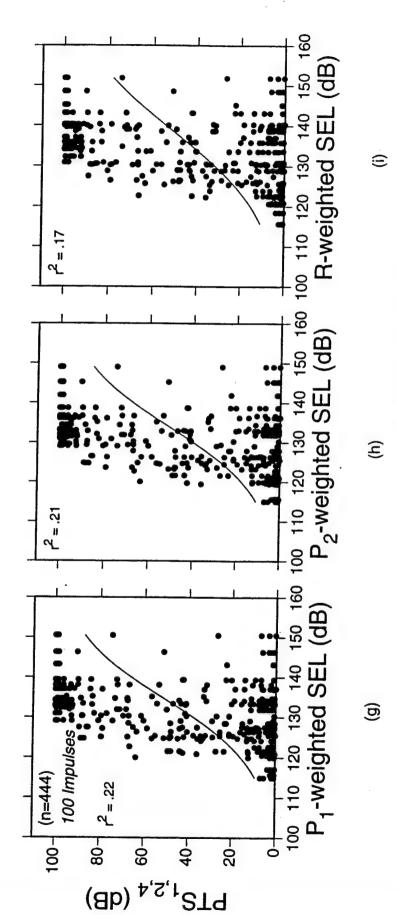
weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) $P_{
m 1}$ each regression line are listed in Table 13. ($r^2 = \text{coefficient of determination}$) Figure 52 (g-i)



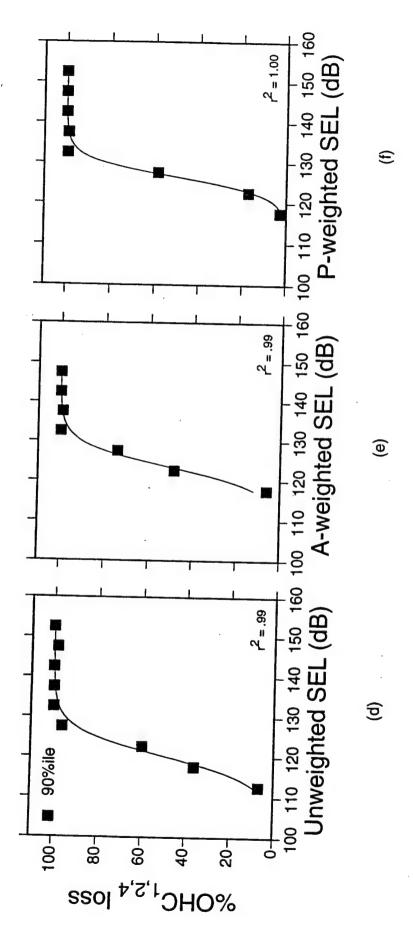
100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to are listed in Table 13. (r^2 = coefficient of determination) Figure 53 (d-f)



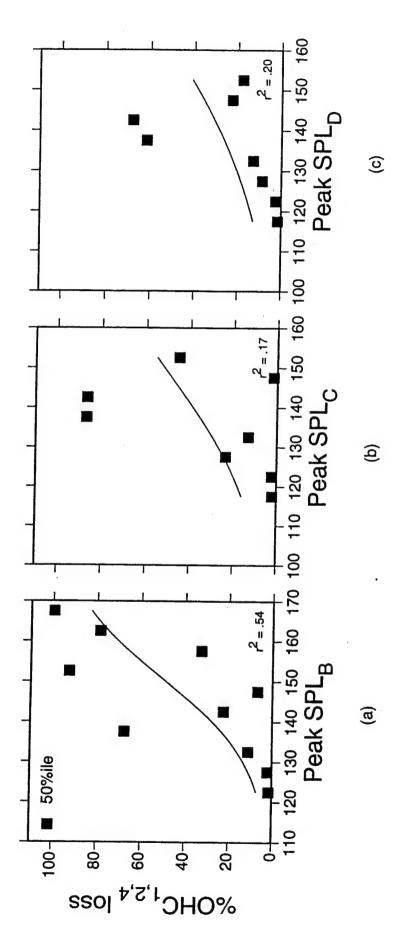
the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to animals exposed to 100 impulses (n=444) at the indicated level of the hazard index (a) Peak SPL_R, Figure 54 (a-c) The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all are listed in Table 14. (r^2 = coefficient of determination)



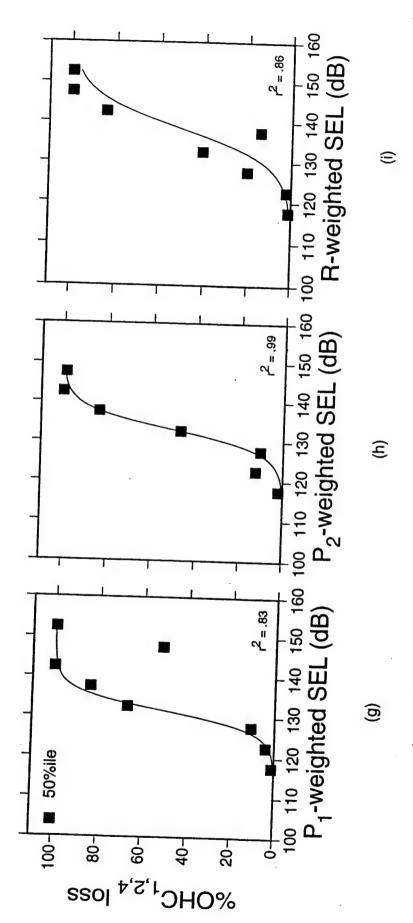
animals exposed to 100 impulses (n=444) at the indicated level of the hazard index (g) P1-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of The average percent OHC loss in the cochlea over octave-band lengths of the basilar membrane Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all each regression line are listed in Table 14. ($r^2 = \text{coefficient of determination}$) Figure 54 (g-i)



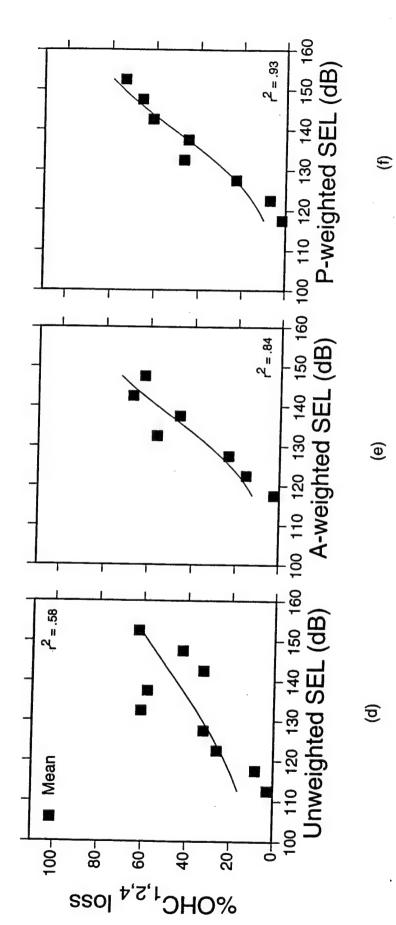
fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 14. ($r^2 = \text{coefficient of determination}$) Figure 55 (d-f)



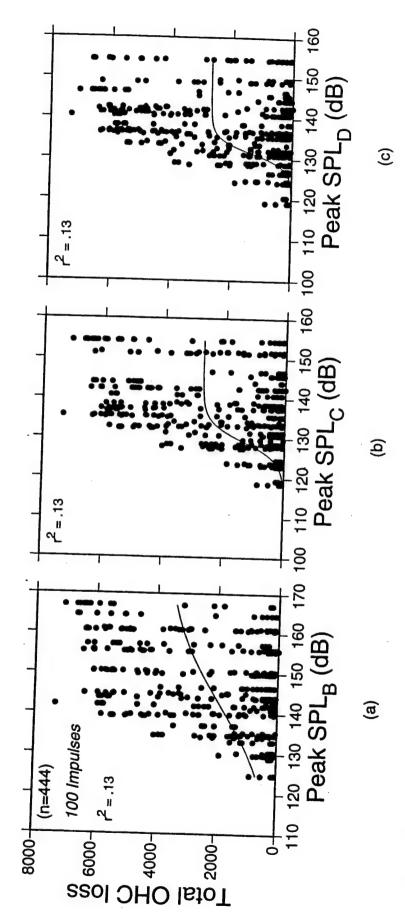
index (a) Peak SPL_B, (b) Peak SPL_C, and (c) Peak SPL_D. The solid line is the nonlinear regression fit membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to for all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard Figure 56 (a-c) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar each regression line are listed in Table 14. ($r^2 = \text{coefficient of determination}$)



P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar regression line are listed in Table 14. ($r^2 = coefficient$ of determination) Figure 56 (g-i)

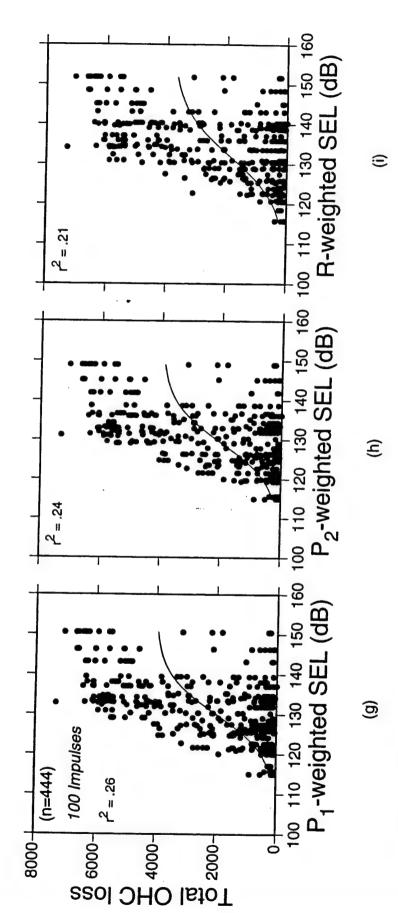


at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-Figure 57 (d-f) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to listed in Table 14. (r^2 = coefficient of determination)

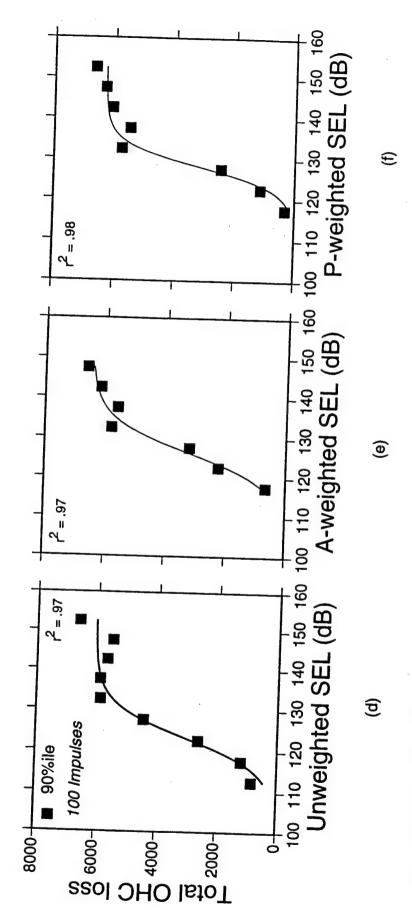


of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear Figure 58 (a-c) Total OHC loss in the cochlea of each animal exposed to 100 impulses (n=444) at the indicated level regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20)

corresponding to each regression line are listed in Table 15. (r^2 = coefficient of determination)

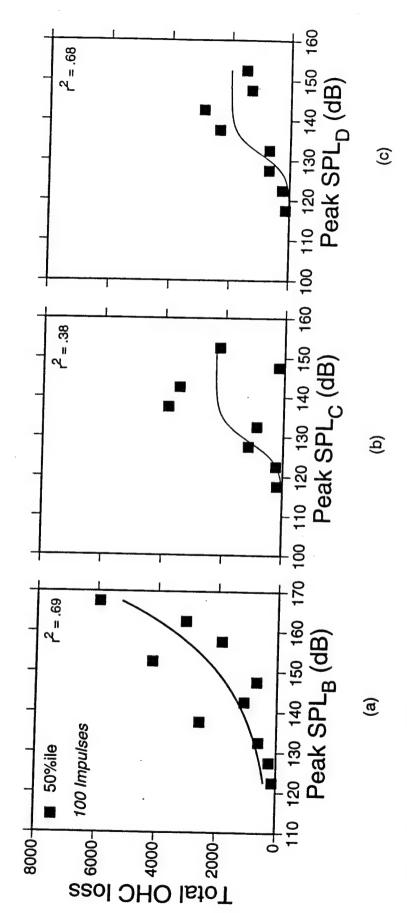


of the hazard index (g) P1-weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line Figure 58 (g-i) Total OHC loss in the cochlea of each animal exposed to 100 impulses (n=444) at the indicated level is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 15. (r^2 = coefficient of determination)

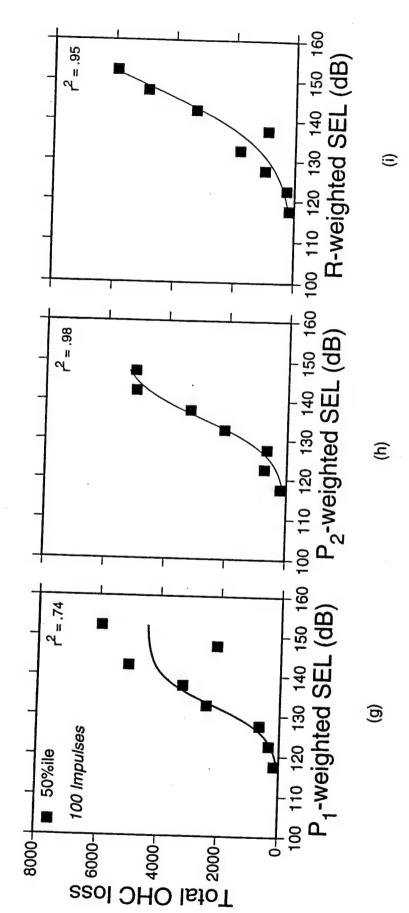


SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, Figure 59 (d-f) The 90th percentile total OHC loss for all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted A, B, and C of Equation (20) corresponding to each regression line are listed in Table 15. ($r^2 =$

coefficient of determination)

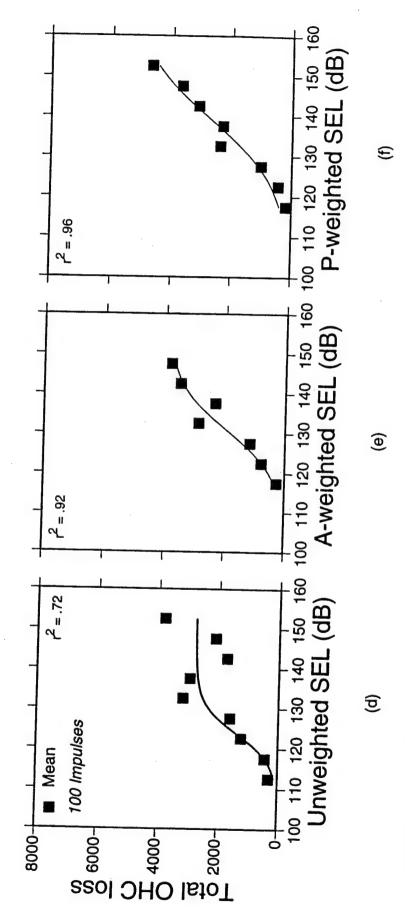


the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid Figure 60 (a-c) The 50th percentile total OHC loss for all animals exposed to 100 impulses falling within 5 dB bins of line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 15. (r^2 = coefficient of determination)



SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted The 50th percentile total OHC loss for all animals exposed to 100 impulses falling within 5 dB bins of Figure 60 (g-i)

A, B, and C of Equation (20) corresponding to each regression line are listed in Table 15. ($r^2 =$ coefficient of determination)



and C of Equation (20) corresponding to each regression line are listed in Table 15. (r^2 = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, Figure 61 (d-f) The mean total OHC loss for all animals exposed to 100 impulses falling within 5 dB bins of the determination)

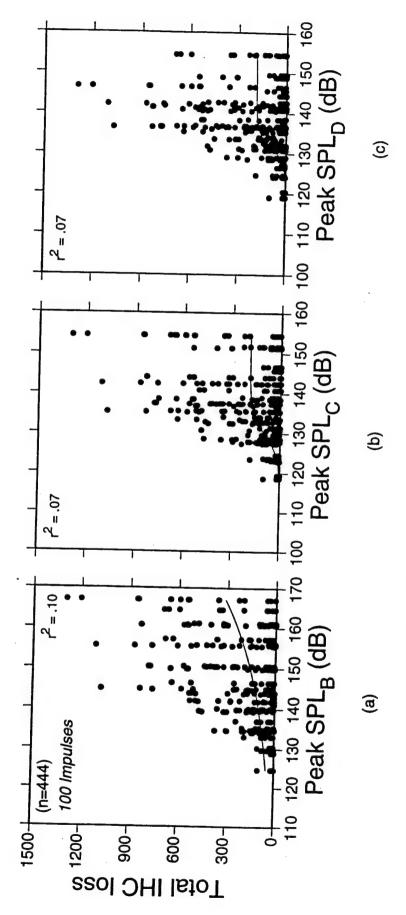
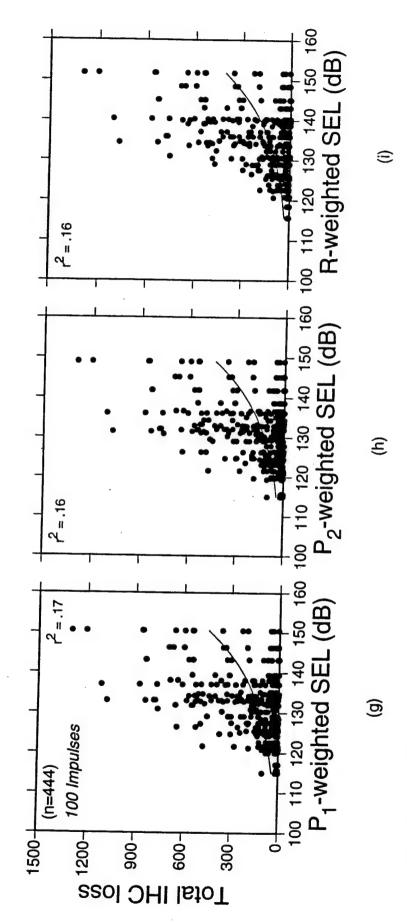
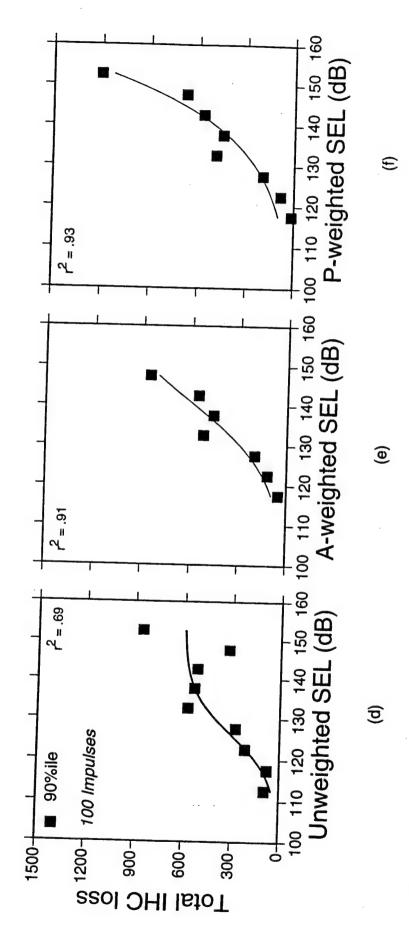


Figure 62 (a-c) Total IHC loss in the cochlea of each animal exposed to 100 impulses (n=444) at the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20)

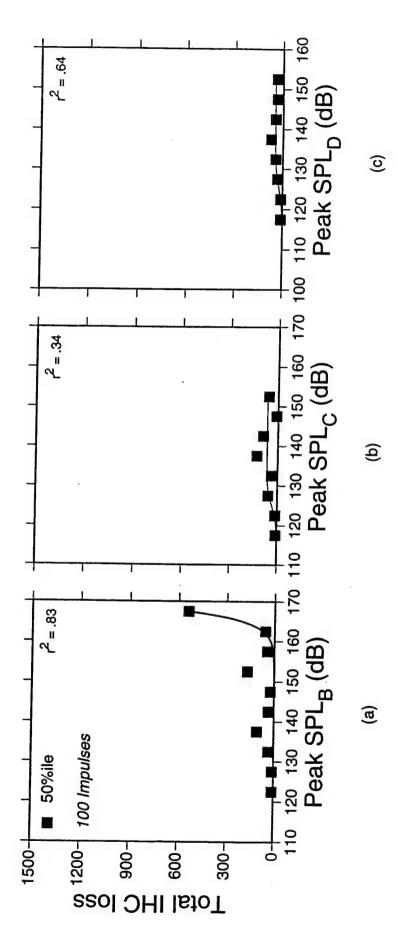
corresponding to each regression line are listed in Table 16. (r^2 = coefficient of determination)



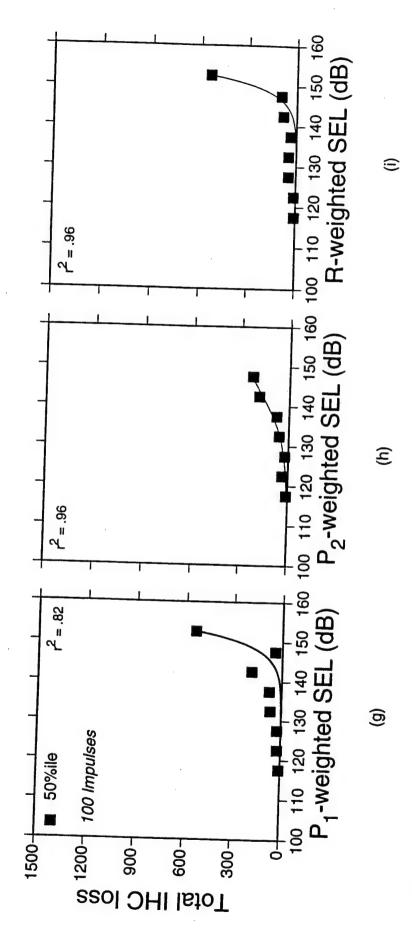
the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is Figure 62 (g-i) Total IHC loss in the cochlea of each animal exposed to 100 impulses (n=444) at the indicated level of the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 16. ($r^2 = \text{coefficient of}$ determination)



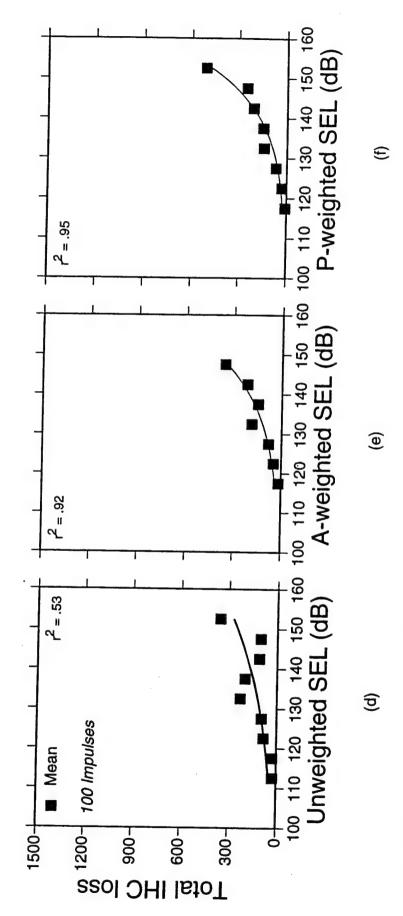
The 90th percentile total IHC loss for all animals exposed to 100 impulses falling within 5 dB bins of the and C of Equation (20) corresponding to each regression line are listed in Table 16. (r^2 = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 63 (d-f)



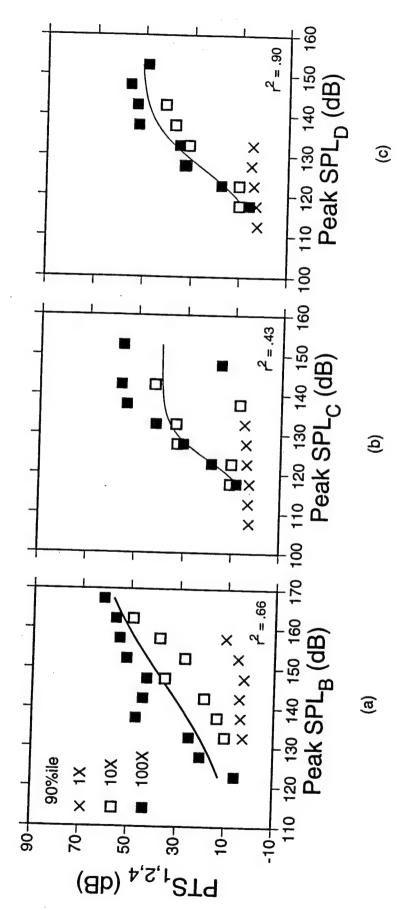
and C of Equation (20) corresponding to each regression line are listed in Table 16. (r^2 = coefficient Figure 64 (a-c) The 50th percentile total IHC loss for all animals exposed to 100 impulses falling within 5 dB bins of solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The of determination)



The 50th percentile total IHC loss for all animals exposed to 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. and C of Equation (20) corresponding to each regression line are listed in Table 16. (r^2 = coefficient of The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, determination) Figure 64 (g-i)



and C of Equation (20) corresponding to each regression line are listed in Table 16. (r^2 = coefficient of indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the data. The three parameters, A, B, Figure 65 (d-f) The mean total IHC loss for all animals exposed to 100 impulses falling within 5 dB bins of the determination)



exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Figure 66 (a-c) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of corresponding to each regression line are listed in Table 17. (r^2 = coefficient of determination) Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20)

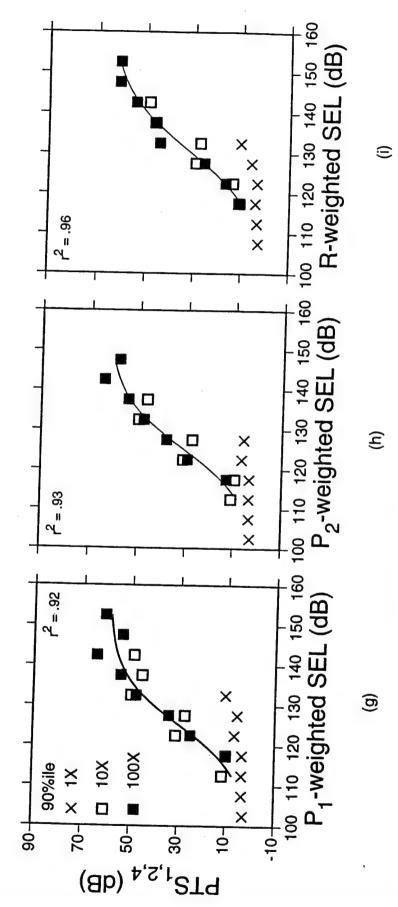


Figure 66 (g-i) The 90th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) P₂-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of corresponding to each regression line are listed in Table 17. (r^2 = coefficient of determination) Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20)

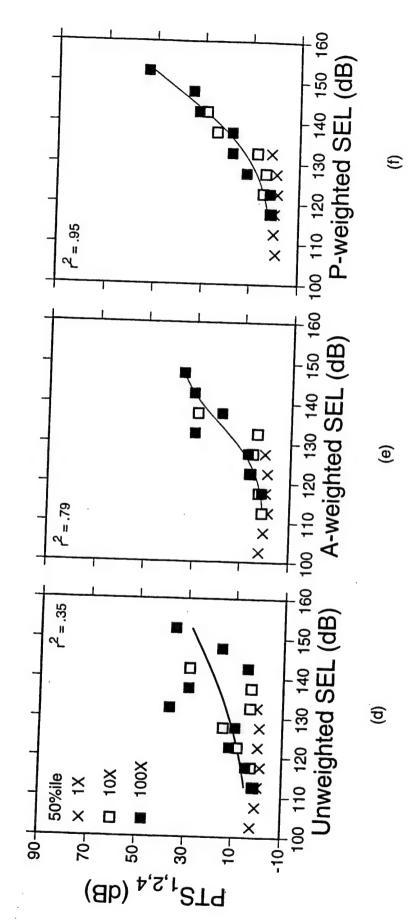


Figure 67 (d-f) The 50th percentile average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20)

corresponding to each regression line are listed in Table 17. (r^2 = coefficient of determination)

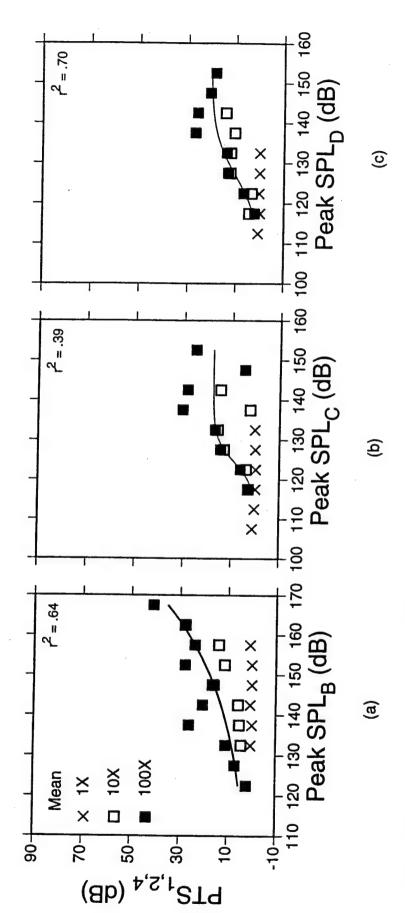
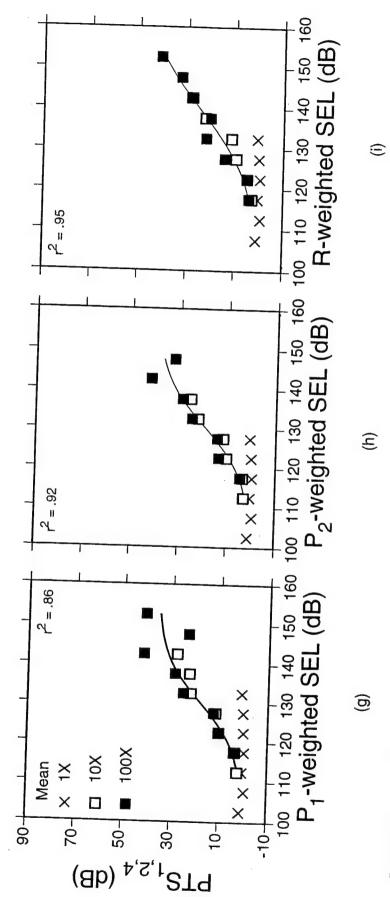


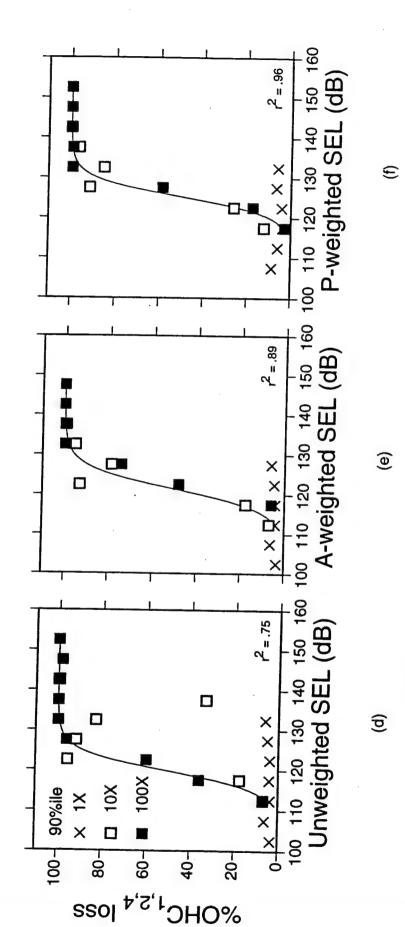
Figure 68 (a-c) The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 1, (b) Peak SPL $_{\rm C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of Equation (20) to the $10,\,\mathrm{or}\,100$ impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_\mathrm{B}$, 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding to each

regression line are listed in Table 17. ($r^2 = \text{coefficient of determination}$)

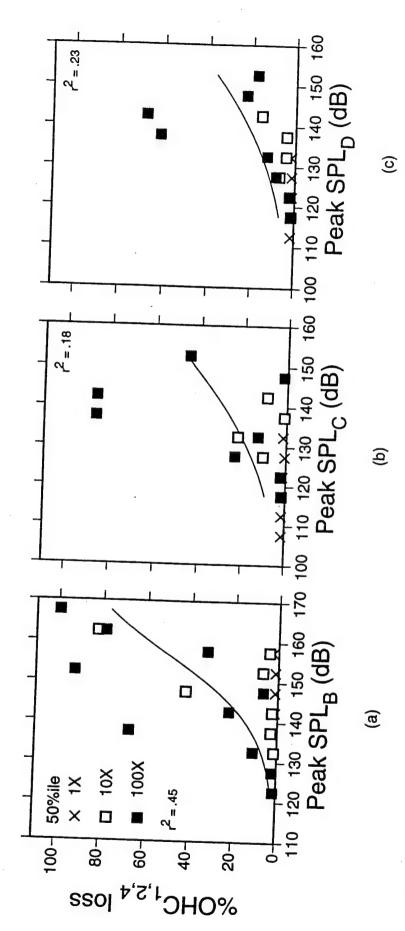


The mean average PTS measured at the 1, 2, and 4 kHz test frequencies for all animals exposed to 1, 10, P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P₁-weighted SEL, (h) the 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding to each Figure 68 (g-i)

regression line are listed in Table 17. ($r^2 = \text{coefficient of determination}$)

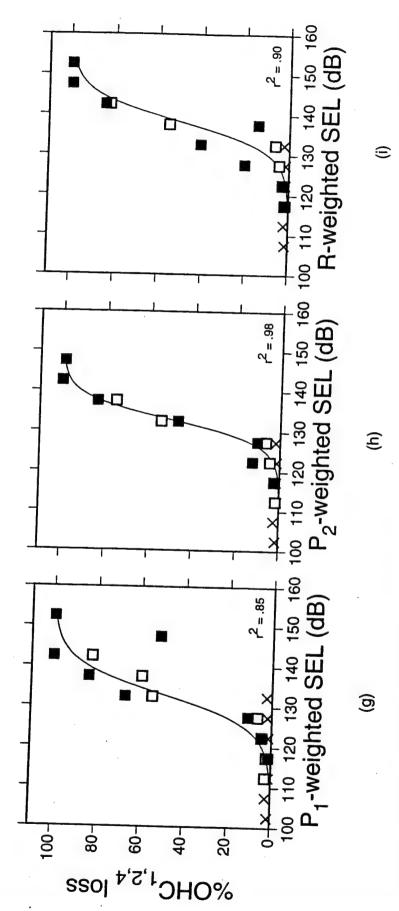


Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit The 90th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) of Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 18. ($r^2 =$ coefficient of determination) Figure 69 (d-f)



index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The solid line is the nonlinear regression fit of membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard Figure 70 (a-c) The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20)

corresponding to each regression line are listed in Table 18. (r^2 = coefficient of determination)



Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding weighted SEL, (h) P2-weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of The 50th percentile of percent OHC loss in the cochlea over octave-band lengths of the basilar membrane exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals to each regression line are listed in Table 18. ($r^2 = \text{coefficient of determination}$) Figure 70 (g-i)

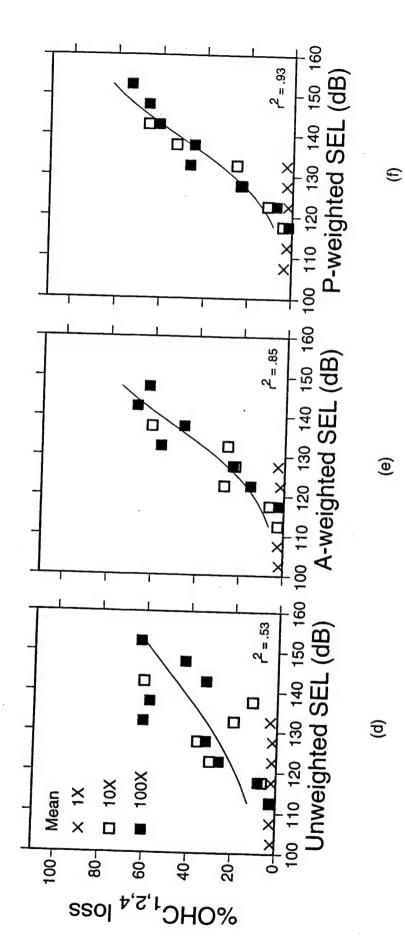
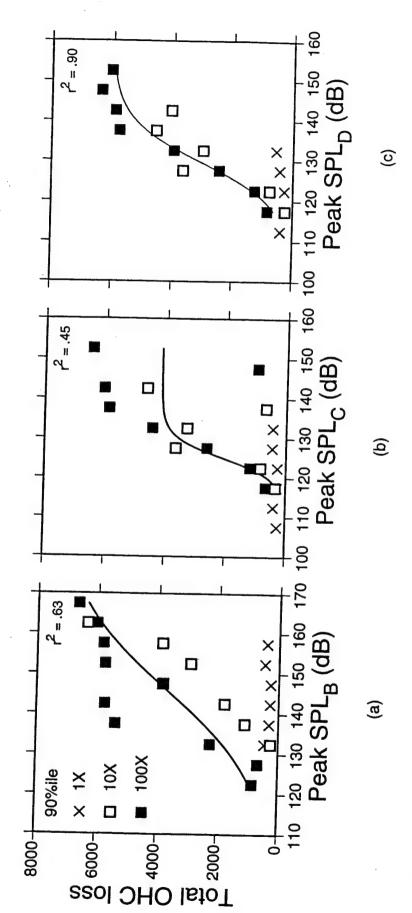


Figure 71 (d-f) The mean percent OHC loss in the cochlea over octave-band lengths of the basilar membrane centered at the locations correlated with the 1, 2, and 4 kHz audiometric test frequencies for all animals exposed to 1, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, to the 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 18. ($r^2 = \text{coefficient of determination}$)



solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three parameters, Figure 72 (a-c) The 90th percentile of total OHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The

A, B, and C of Equation (20) corresponding to each regression line are listed in Table 19. (r^2 = coefficient of determination)

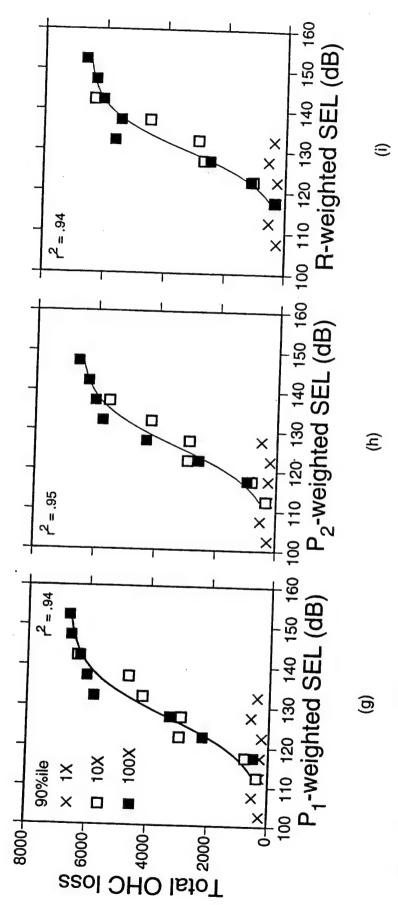


Figure 72 (g-i) The 90th percentile of total OHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 19. ($r^2 =$ The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three coefficient of determination)

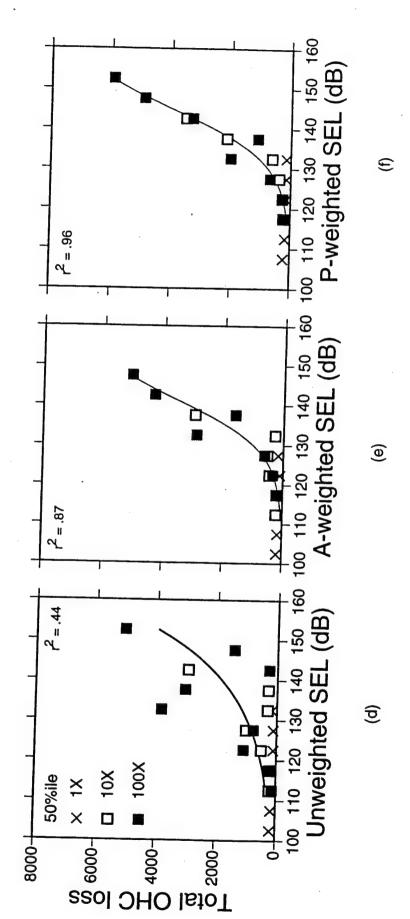
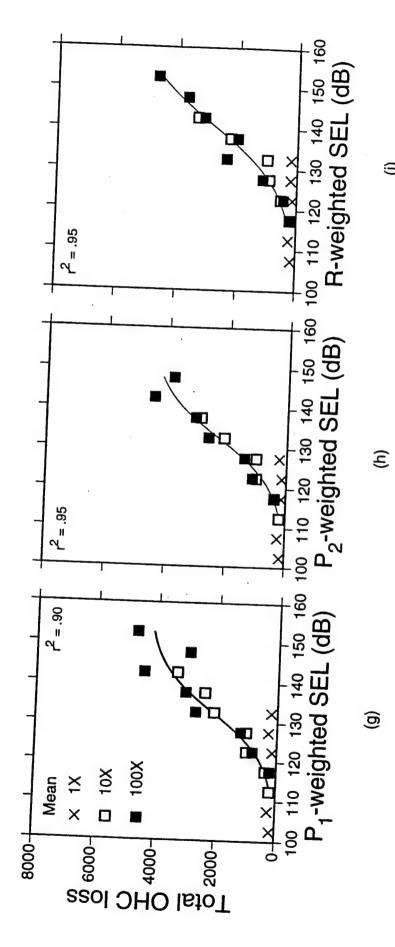


Figure 73 (d-f) The 50th percentile of total OHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 19. ($r^2 =$ The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three coefficient of determination)



solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three parameters, A, indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The Figure 74 (g-i) The mean total OHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the B, and C of Equation (20) corresponding to each regression line are listed in Table 19. (r^2 = coefficient of determination)

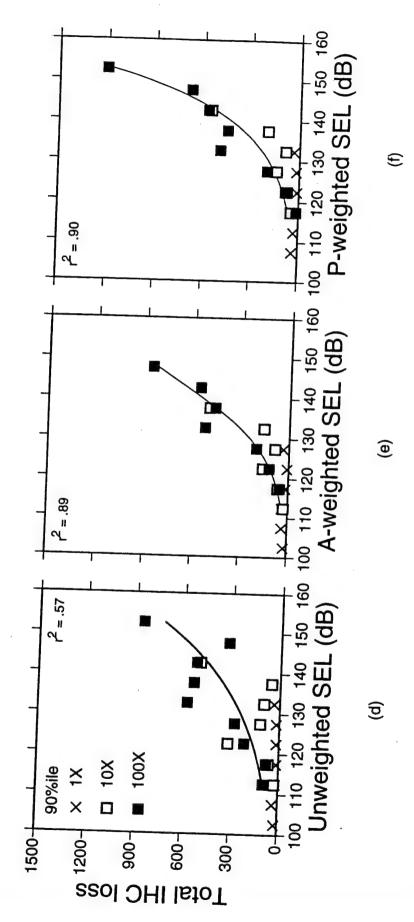
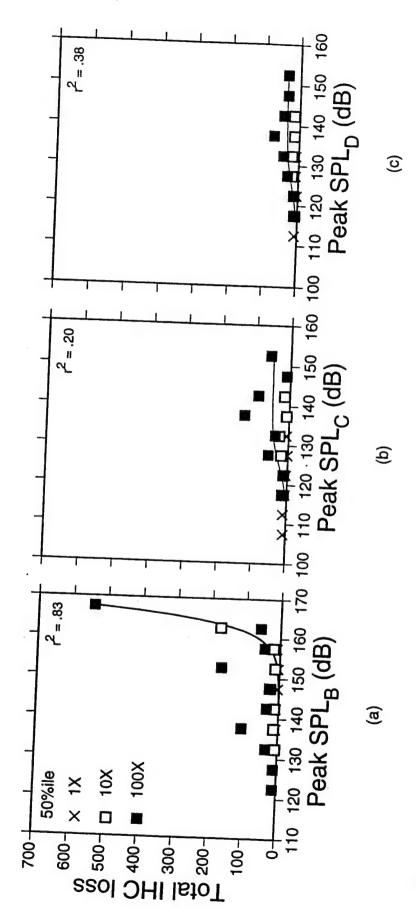
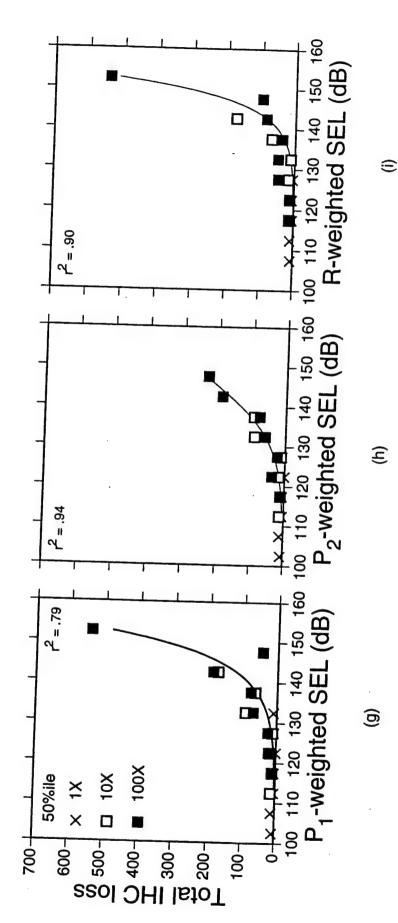


Figure 75 (d-f) The 90th percentile of total IHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 20. ($r^2 =$ The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three coefficient of determination)



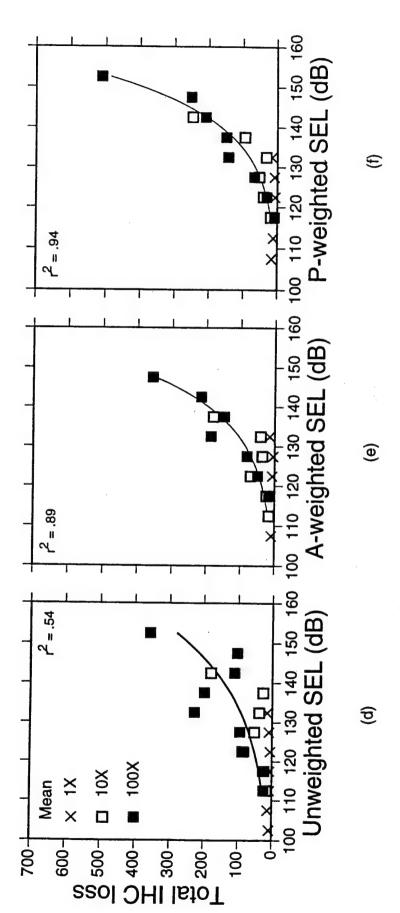
solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 20. (r^2 = coefficient Figure 76 (a-c) The 50th percentile of total IHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (a) Peak SPL $_{
m B}$, (b) Peak SPL $_{
m C}$, and (c) Peak SPL $_{
m D}$. The

of determination)



The 50th percentile of total IHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (g) P_1 -weighted SEL, (h) P_2 -weighted SEL, and (i) R-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three Figure 76 (g-i)

parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 20. ($r^2 =$ coefficient of determination)



parameters, A, B, and C of Equation (20) corresponding to each regression line are listed in Table 20. (r² Figure 77 (d-f) The mean total IHC loss for all animals exposed to 1, 10, or 100 impulses falling within 5 dB bins of the indicated level of the hazard index (d) Unweighted SEL, (e) A-weighted SEL, and (f) P-weighted SEL. The solid line is the nonlinear regression fit of Equation (20) to the 10X and 100X data. The three = coefficient of determination)

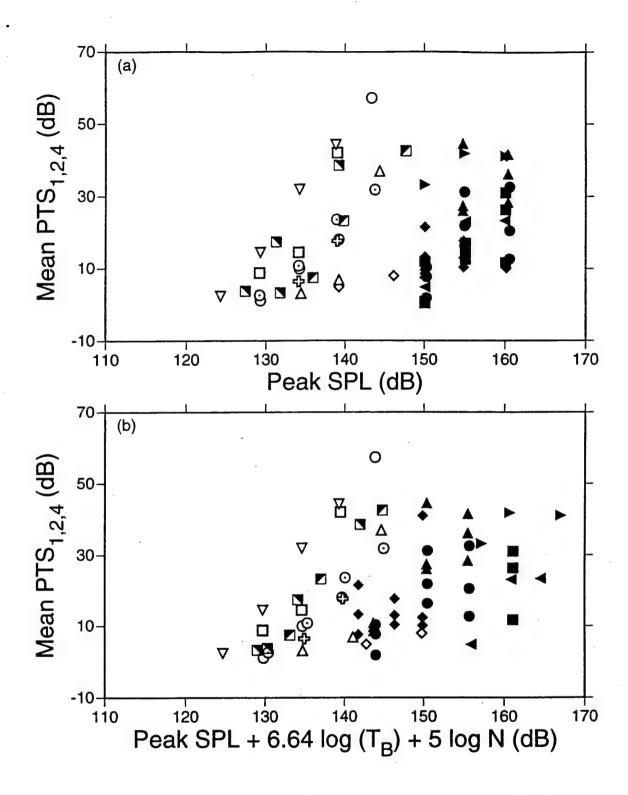


Figure 78. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (a) peak SPL and (b) Peak SPL_B. The key to the symbols is found in Table 21.

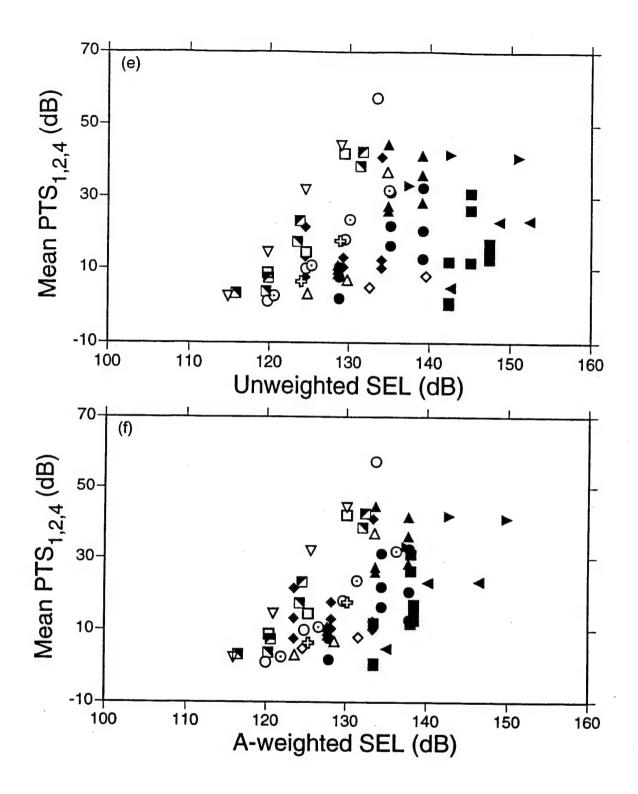


Figure 78. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (e) Unweighted SEL and (f) A-weighted SEL. The key to the symbols is found in Table 21.

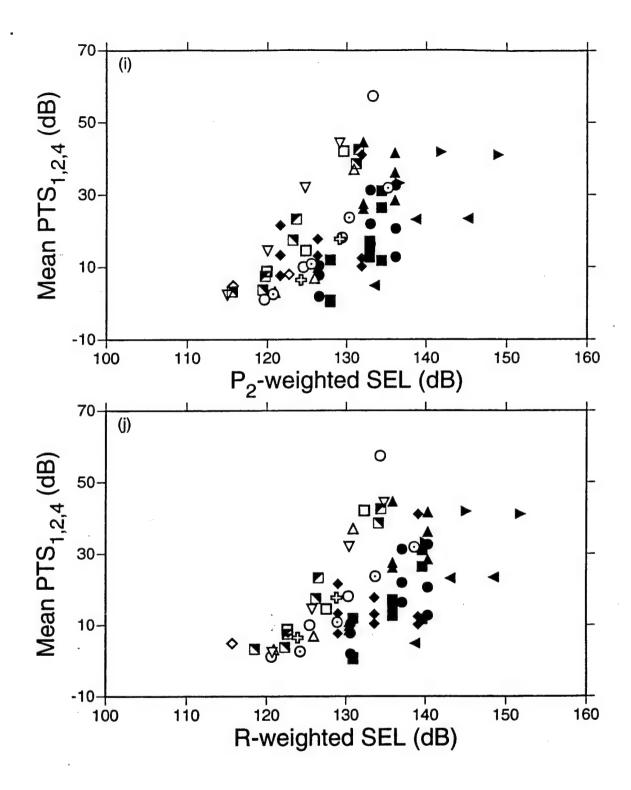


Figure 78. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (i) P₂-weighted SEL and (j) R-weighted SEL. The key to the symbols is found in Table 21.

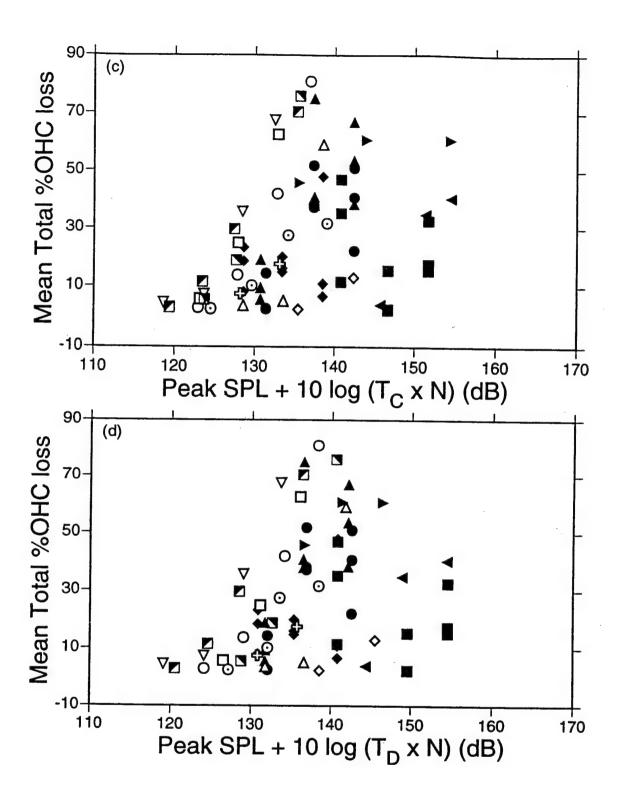


Figure 79. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (c) peak $\mathrm{SPL}_{\mathrm{C}}$ and (d) Peak $\mathrm{SPL}_{\mathrm{D}}$. The key to the symbols is found in Table 21.

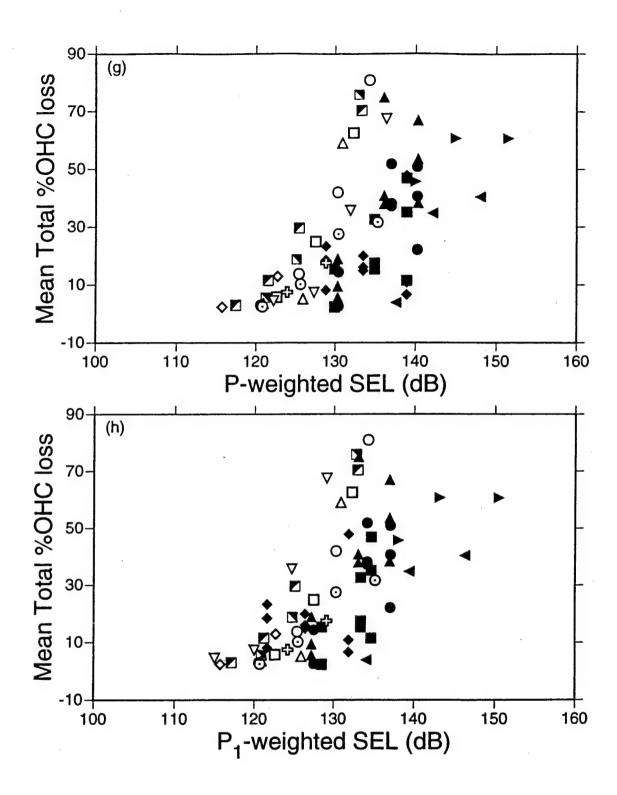


Figure 79. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (g) P-weighted and (h) P₁ -weighted. The key to the symbols is found in Table 21.

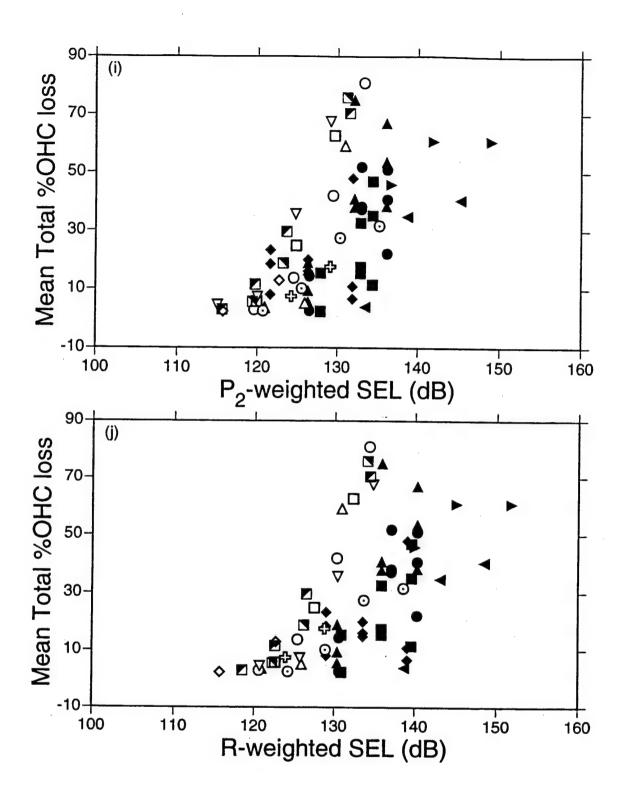


Figure 79. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (i) P_2 -weighted SEL and (j) R-weighted SEL. The key to the symbols is found in Table 21.

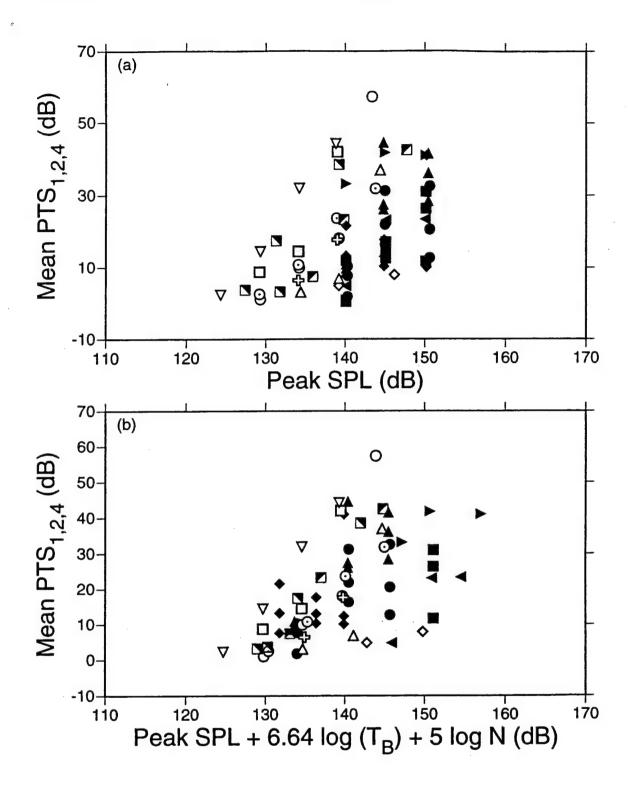


Figure 80. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (a) peak SPL and (b) Peak SPL_B. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

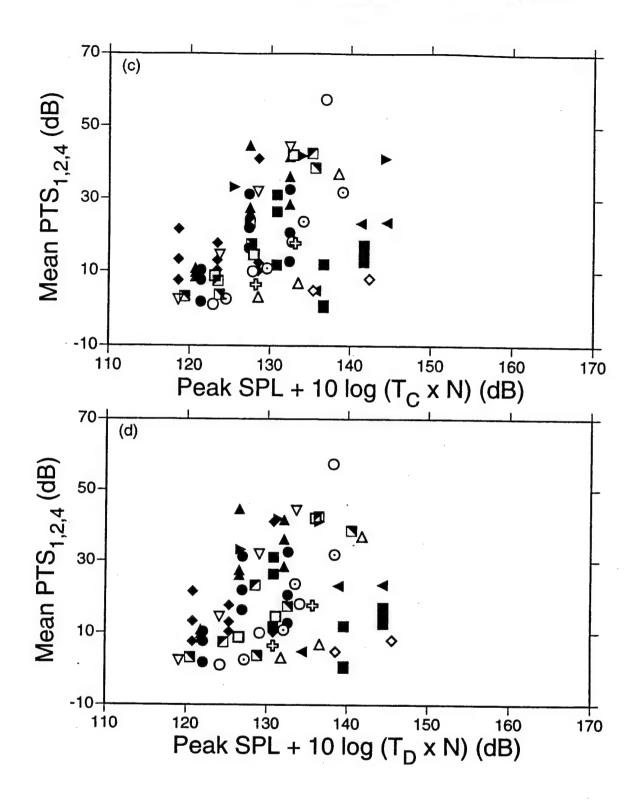


Figure 80. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (c) peak SPL and (d) Peak SPL . The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

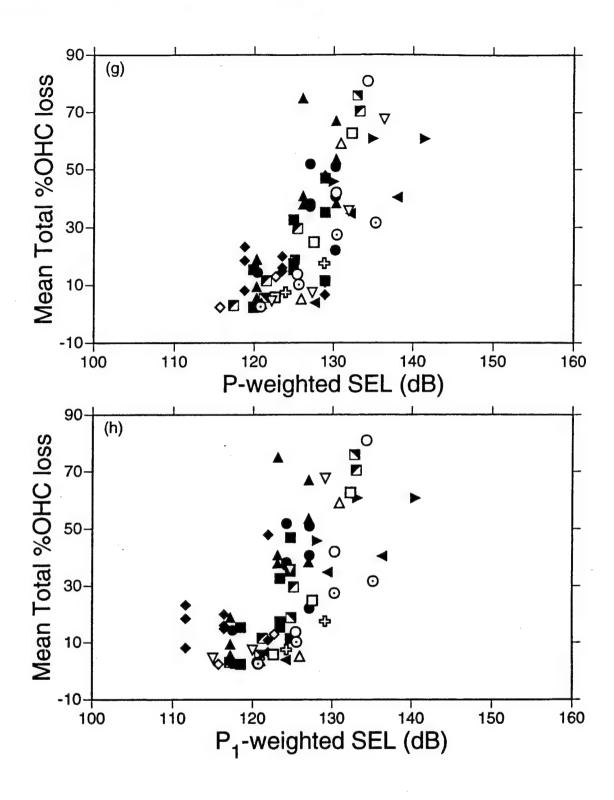


Figure 81. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (g) P-weighted and (h) P_1 -weighted. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

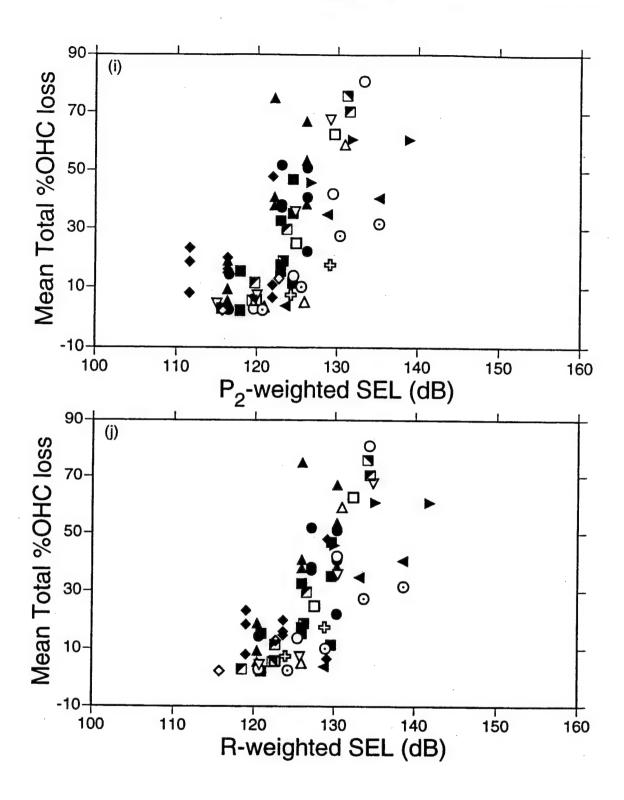


Figure 81. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (i) P₂-weighted SEL and (j) R-weighted SEL. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

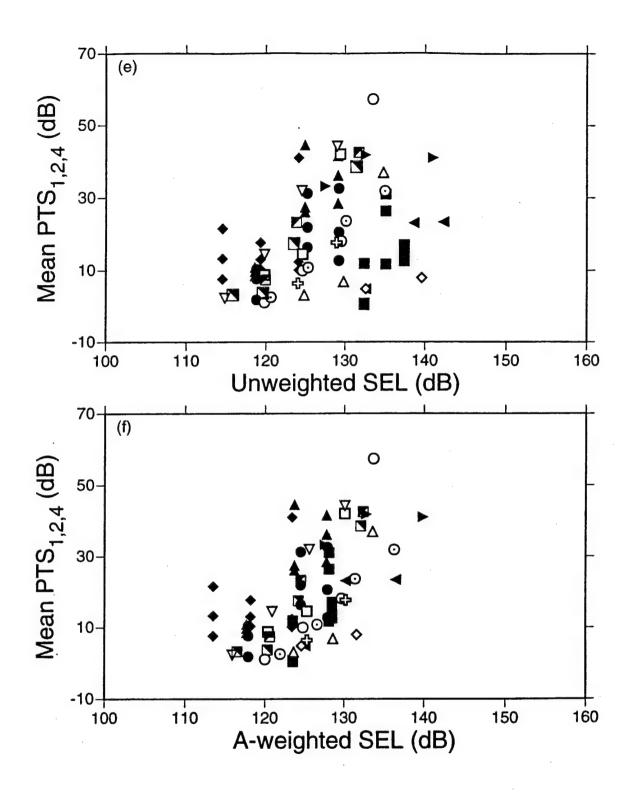


Figure 80. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (e) Unweighted SEL and (f) A-weighted SEL. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

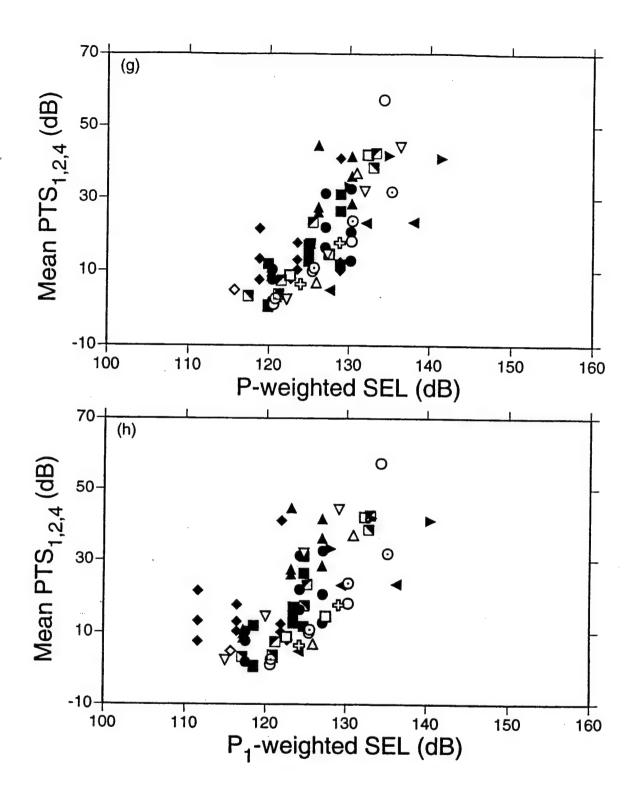


Figure 80. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (g) P-weighted SEL and (h) P_1 -weighted SEL. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

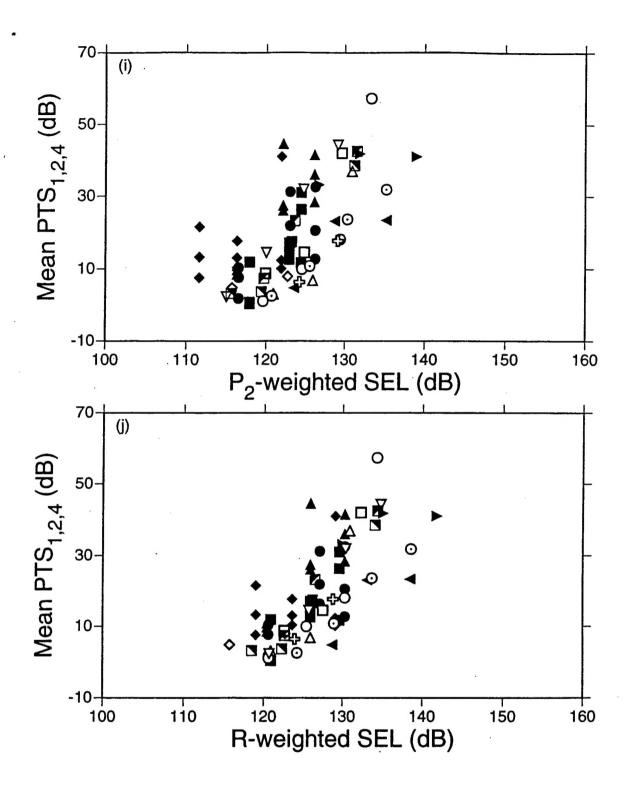


Figure 80. Mean PTS measured at the 1, 2, and 4 kHz audiometric test frequencies for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (i) P_2 -weighted SEL and (j) R-weighted SEL. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

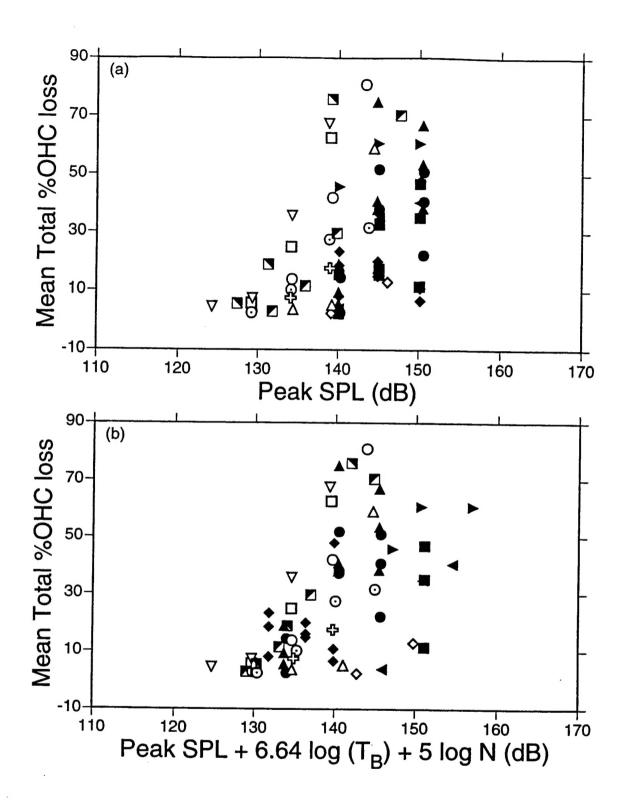


Figure 81. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (a) peak SPL and (b) Peak SPL_B. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

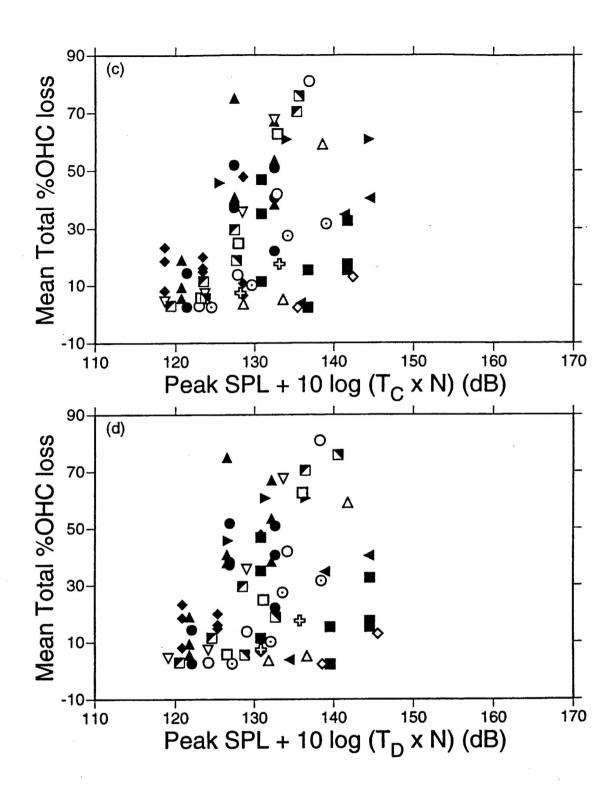


Figure 81. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (c) peak $\mathrm{SPL}_{\mathrm{C}}$ and (d) Peak $\mathrm{SPL}_{\mathrm{D}}$. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.

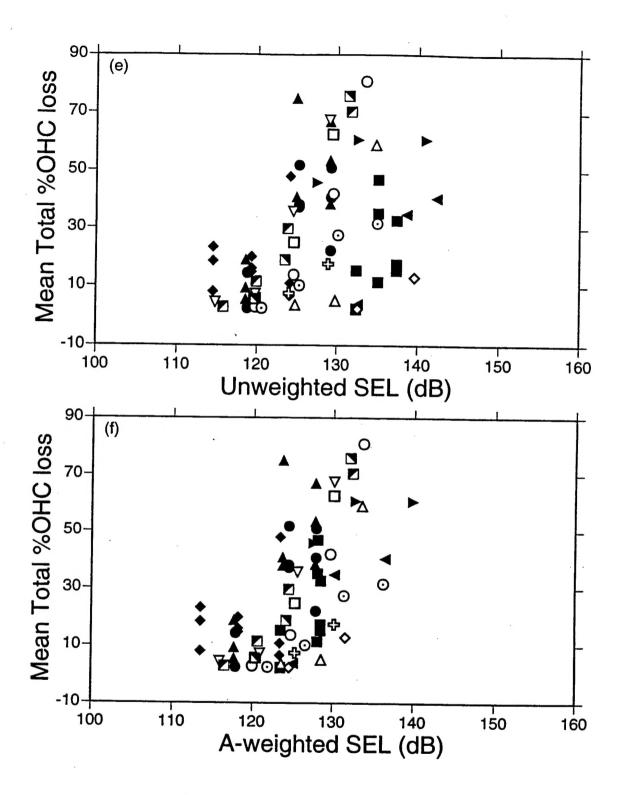


Figure 81. Mean total percent OHC loss for groups of animals exposed to 100 impulses from one of 16 impulse noise sources for different levels of the hazard index: (e)Unweighted SEL and (f) A-weighted SEL. The SUNY data were shifted 10 dB to the left in these figures. The key to the symbols is found in Table 21.